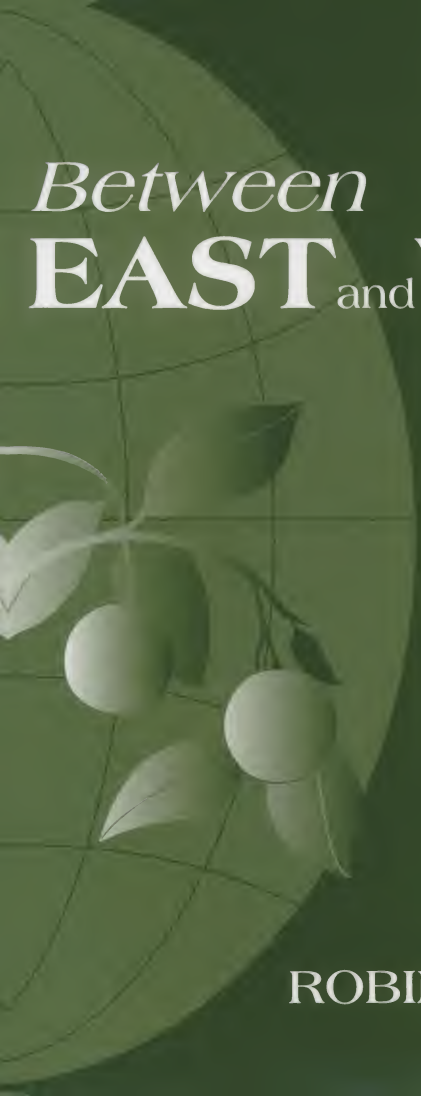
Between EAST and WEST

The Moluccas and the Traffic in Spices Up to the Arrival of Europeans



ROBIN A. DONKIN

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To
the memory of
JIM PARSONS
1915–1997
Itinerant Geographer

...the Iles
Of *Ternate* and *Tidore*, whence Merchants bring
Thir spicie Drugs: ...

John Milton, *Paradise Lost* (1667) Book 2: 638–640

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ACKNOWLEDGMENTS

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PROLOGUE

The peoples of Europe from the earliest times have regarded the lands that lay to the east and south as places of mystery and imagination and of fabulous wealth—the farther away, the richer they were thought to be. Distance, as ever, lent enchantment.

The Chinese perspective was the reverse of the European. From the eastern perimeter of the Old World, countries to the west and south, similarly clothed in fantasy and fable, promised riches on an ascending scale. And between the two lay India, on the opposing limits of direct European and Chinese experience and the symbol and proximate source of respective eastern and western luxuries at the beginning of the first millennium. In due course, 'India' was twice transplanted—farther east and west—to form the 'Indies.'

Europe and China came of age at approximately the same time, under the Romans and the Han respectively, two hundred years or so on either side of the birth of Christ. In both regions, there followed outward-looking periods of innovation and discovery, separated by times of repose and introspection: not one but several Ages of Discovery, leading to the epochal fifteenth century when, within a single lifespan, state-sponsored armadas carried Chinese envoys to the shores of East Africa and Vasco da Gama's small convoy rounded the Cape and (with the help of a Gujarātī pilot) reached the shores of western India. The irony was that the Chinese then officially turned their backs on the sea and on the West, while Europeans pressed on beyond India to the very gates of China.

Five years before Da Gama reached Calicut, Columbus, sailing westward in search of the East, stumbled on an intervening "Other World." A few decades later, the remnants—one ship out of five—of Magellan's expedition, likewise sailing westward, limped back to San Lúcar de Barrameda, having completed a matchless voyage of discovery, the first circumnavigation of the globe.

What drove men to such extraordinary feats, full of hardship and danger, the odds stacked heavily against a safe return? A sense of adventure and curiosity, doubtless; occasionally to advance the frontiers of religion. Chiefly, however, it was thoughts of material gain: gold and silver in easy abundance, the legendary *El Dorados*, and, perhaps more especially, merchandise that was altogether unavailable in Europe—strange jewels, orient pearls, rich textiles,

and animal and vegetable products of equatorial provenance. These were the rewards of success. Only silk among eastern *exotica* was successfully introduced to the West (in the sixth century). For the rest, the East and South were epitomized by pearls and spices, and likewise the West and South to the Chinese. Pearls came chiefly from the Persian Gulf, southern India, and Sri Lanka, and, after ca. 1500, tropical waters of the New World. So clearly was this objective identified that by 1525 all the main fishing grounds of the world were controlled by either Spain or Portugal.[1]

Perlas and *especiería*—along with *piedras preciosas*, *oro*, and *plata*—were named in the *Capitulaciones* agreed between Columbus and Ferdinand and Isabella on April 17, 1492.[2] Spices included both condiments and medicinal drugs, many of them aromatic. The wealth of the East was thought, in Europe, to consist primarily and inexhaustibly of fine spices. Some were more easily obtainable than others, coming from the Levant, rather than India or the Far East. Nevertheless, it is surprising how early—in late Antiquity and the early Middle Ages—that products of very remote origin were available to a select few in northern and western Europe. Purchasing power was, even then, sufficiently large and concentrated to make it worth transporting the most desirable and costly luxuries across half the world.

The ultimate goal was to obtain supplies of spices at source and then to meet demand from whatever quarter. Shippers were not limited to national markets. Venice and Constantinople, Lisbon and Seville served the whole of Europe and parts of western and west-central Asia, whether for bullion or spices. After ca. 1500, European merchants operated much farther afield in India, China, and Japan.

South East Asia was one of the principal sources of spices and *aromata*.[3] Some spices were found over large areas, but the distances from Europe were always immense. The notion that some of the rarest items belonged to "paradise islands" on the eastern margins of the Old World was very old and, moreover, proved to be true. Clove, nutmeg, mace, and sandalwood all came, and effectively only came, from easternmost Indonesia. Malay merchants claimed that "God made Timor for sandalwood and Banda for mace and the Moluccas for cloves, and that this merchandise is not known anywhere else in the world except in these places; and [Tomé Pires] asked and enquired very diligently whether they had this merchandise anywhere else and every one said not."[4]

No European reached these islands before 1500; more surprising, no Arab or Indian merchant venturer did so either, as far as we are aware. Yet supplies of the local aromatics were reaching China, India, western Asia, and the Mediterranean lands more than a thousand years earlier, probably before the beginning of the Christian era. The activities of scores of merchants made this

possible, although, none could have been familiar with, or were even perhaps aware of, the entire route, and few of whom can have had any clear idea of the ultimate provenance of the products in transit. So far as the middle stages (western Indonesia to India) were concerned, Persian and Arab traders can only be invoked from the seventh or eighth century, when they first reached the China Seas. The merchants of earlier centuries appear to have been Indians as well as Malays and Javanese who, in any event, handled the early stages, from the Moluccas to Java, at all times prior to ca. 1500.

To account for the presence of South East Asian products in Europe in the early Christian centuries, it is essential to emphasize the strong Indian connection with Indonesia from about this time or earlier. Thereby a 'bridge' was created that carried people and ideas and commodities through the archipelago in both directions. It is essential to emphasize, too, that the Indians themselves were great users of the same aromatics that so attracted Europeans. This 'bridge' was extended westward through Indian influence in the medical centers of the Near East and more especially at Gondēshapūr in Khūzestān (Map 8, chapter 4) between the fifth and the ninth centuries.

No sooner had the Portuguese taken Malacca in 1511 than they despatched a small force to locate the "Spice Islands."[5] Once it reached Banda (1512), contact with the Moluccas proper and with Timor quickly followed. Thence, for the first time, cloves and nutmegs and sandalwood were brought all the way to Europe in European ships—the longest maritime trade route on earth. For those who completed the voyage, profits were rewardingly high; what formerly had been shared among many merchants was now concentrated in the hands of a few. Magellan took with him cloves, nutmegs, and mace (just as Columbus took pearls) to show the local people for what he was looking.[6] The *Vittoria* returned with 533 quintals (ca. 53,000 pounds) of cloves, sole tangible reward of the circumnavigation, yet sufficient in value, at a notional profit of 2500 per cent, to cover the financial cost of the expedition. Sebastián del Cano, who assumed command on the death of Magellan on April 27, 1521, was knighted on his return to Spain by Charles I (Emperor Charles V). Del Cano's escutcheon (Figure 11, chapter 1) pointedly displayed crossed sticks of cinnamon on a ground patterned with cloves and nutmegs, under a globe with the enscrolled motto: *Primus Circumdedisti Me.*

The East has retained its reputation for, and intense interest in, evocative aromas. Peoples of the West, on the other hand, have tended to neglect, or rather to forget, the part that the mysterious sense of smell played in the selection processes leading to plant protection, improvement, and exploitation.

Aromatic substances—condiments, perfumes, medicaments—have been regarded either as necessities or as luxuries, depending on the wealth and

social position of the user. Familiarity with one product doubtless led to interest in others. Natural scents borne on offshore winds advertised the distant presence of exotic species. Some were misidentified at first or confused with known aromas, circumstances that help to account for exploitation by strangers when the resident population showed little or no interest.

The present study of Moluccan spices and of sandalwood opens with their natural history and oriental nomenclature, and the discovery of the Moluccas by Europeans. The purpose is to trace the expanding interest and long-distance trade in cloves, nutmegs, and sandalwood, first, apparently, to India at an indeterminately early date and thence to the adjacent Arabo-Persian world. The medieval West and China lay on the western and eastern margins of diffusion, the former in touch with the Levant, the latter with the trading world of South East Asia. Two thousand years or so ago, peoples of Indian and Chinese provenance expanded, independently, into South East Asia, giving rise to what today we call Indochina and Indonesia. The respective motives for expansion were broadly similar: the presence of desirable natural products and rumors of great wealth, inducements that ultimately brought Europeans into the same arena.

Notes

1 Donkin, 1998: pp. 280–281.
2 Printed in M. Fernandez de Navarrete, *Obras*, 1955–1956: 1: p. 303.
3 Donkin, 1999: pp. 11–14, and Map 1.
4 Pires [ca. 1512–1515] (ed. and trans. A. Cortesão), 1944: 1: p. 204.
5 A. Cortesão (1973: pp. 98, 158–159) thought that the Portuguese perhaps already knew the position of the Moluccas (? Ptolemy's *Insulae Satyrorum*) on the basis of information taken from "some Oriental chart, probably Arab or Malaysian" and forwarded to Lisbon by Pêro da Covilhã, ca. 1490/1492. There is nothing to support this.
6 Pigafetta [1519–1522] (ed. and trans. R. A. Skelton) 1969: 1: p. 64. Likewise Vasco da Gama (ed. and trans. E. G. Ravenstein) 1898: p. 7 (Bay of St Helena, South West Africa, November 1497).

CHAPTER 1

Nature, Nomenclature, and Discovery of the Moluccas by Europeans

Natural History

For early European accounts of the distribution, ecology, and harvesting of clove and nutmeg we depend heavily, but not exclusively, on half a dozen or so authors: Duarte Barbosa (1518) and Garcia da Orta (1563), both of whom wrote in India; Tomé Pires (1512–1515), resident of Malacca and author of the extraordinarily well-informed *Suma Oriental* (Pires traveled in the Indonesian archipelago as far as Grĕsik in eastern Java); three other sixteenth-century eyewitnesses, Antonio Pigafetta (1521–1522), chronicler of the first circumnavigation, António Galvão (1536–1544), soldier, administrator (*Capitãe*) of the Moluccas and missionary, and Gabriel Rebello, whose *Informação das cousas de Maluco* (1561–1569) is the fullest early account of the islands. Finally there is Georg Eberhard Rumph (1627–1702), usually known as Rumphius, who lived in Amboina for nearly 40 years and whose *Herbarii Amboinensis*, published in six volumes in 1750, is the corner-stone of all scientific observations and one of the greatest contributions of any European to our knowledge of the tropical world.

THE CLOVE: *Eugenia caryophyllus*

Description and Distribution

The earliest first-hand description and illustration of the clove (Figure 1) was provided by Pigafetta:

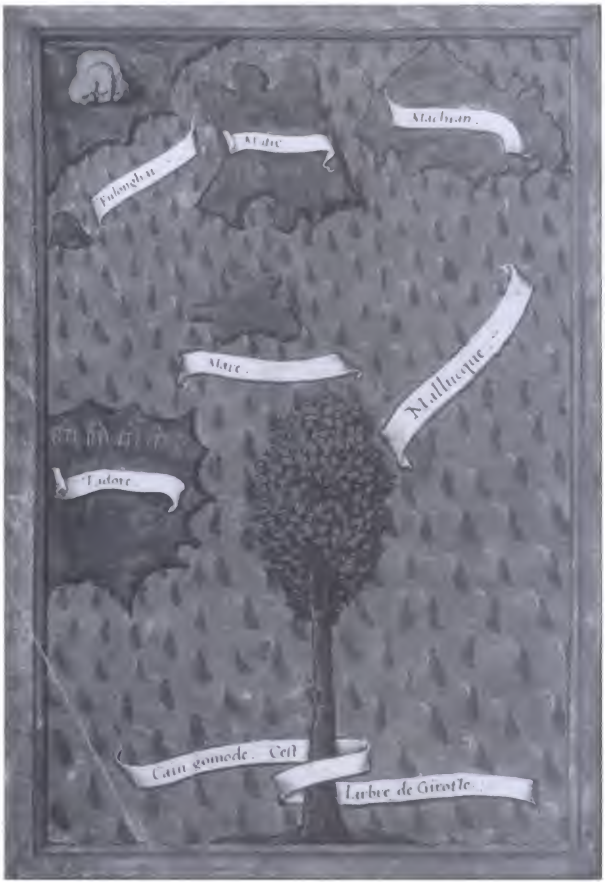


FIGURE 1. Sketch map of the Moluccas and representation of a clove tree. Antonio Pigafetta, *Account of the First Circumnavigation* (ca. 1522), facsimile of the manuscript, 1969.

> The tree is tall [in fact, usually no more than about 40 feet] and as thick across as a man. Its branches in the centre spread out widely, but at the top they grow into a kind of peak. The leaf is like that of a laurel, and the bark of the colour of brown tan. The cloves come at the top of the branches, ten or twenty together.[1] (Figure 2)

To Rumphius, the clove was "the most beautiful, the most elegant, and the most precious of all known trees."[2] (Figure 3) The flower buds (Portuguese *cravo de cabeca*) change color from white to green to red, when they are ready

FIGURE 2. The clove tree, *pianta delli garofani.* Christoval Acosta *Trattato...della historia, natura, et virtu delle Droghe medicinali, et altri semplici dalle Indie Orientali in Europa*...Venetia, 1585 (Burgos, 1578).

to be harvested.[3] The open flowers and fruits or berries ("mother cloves") contain progressively less essential oil. The inflorescent stalks (*cravo de bastão*), which at one time were exported, have between one-quarter and one-third of the oil of the unexpanded buds. Some oil also was extracted from the bark.[4]

At the beginning of the sixteenth century, cloves had the most limited distribution of any widely marketed vegetable product. Reports agree that they were effectively confined to five small islands—"cinco Ilhas do Cravo"[5]—first mapped by Francisco Rodrigues (1512):[6] Ternate (*Tarenate*), Tidore (*Tadore*), Moti (*Mutir*), Makian (*Machian*), and Batjan (*Bacan, Bacchian*).[7] Pigafetta added that trees also were to be found on *Giailolo* (Gilolo or Halmahera) and on a small island (*Mare*) between Tidore and Moti, "but they are not good."[8] Presumably these were untended trees, which almost certainly grew elsewhere in the northern Moluccas and perhaps as far afield as western New Guinea.[9] Rumphius claimed that cloves had been introduced to Amboina a short while before the arrival of the Portuguese (1512) and, by his own day, to Ceram, Buru, Soela (Sula), Sulawesi, and probably Java.[10] The last five are not mentioned as islands with cloves by Tomé Pires (ca. 1515), but he was told that the cloves of Batjan, the largest and southernmost of the five 'true' Moluccas, were wild until a "very short time ago."[11] An adventitious process of diffusion southward and westward presumably was in response to rising demand and rising prices before and particularly after the arrival of Europeans. In peripheral locations, however, the tree was generally less successful than in its homeland. Rumphius believed that God had deliberately planted the precious clove and nutmeg "on a few small islets...hidden in the outermost corner of the Eastern ocean,"[12] beyond which they could not be grown to perfection.

Specimen trees were admired for their beauty and fragrance in private gardens from at least the second half of the eighteenth century.[13] After about 1770, distant plantings, chiefly by the French and the British, had measures of commercial success.[14] Seedlings were taken, more or less surreptitiously, to Mauritius and Bourbon (1770–1772), Cayenne and the French West Indies (1793), Bengal and Sri Lanka (late 1790s),[15] Penang and Sumatra (ca. 1798), to Zanzibar-Pemba (1800–1818) and Madagascar (1820). A specimen reached Kew in 1797 on the initiative of Sir Joseph Banks.[16]

Biology and Ecology

Wild or feral cloves, so-called *Caryophyllum sylvestre*, have larger fruits, coarser leaves, and less essential oil and aroma than cultigens.[17] Within the Moluccas, early improvements were the result of protection, the removal of undergrowth, and systematic harvesting, rather than selection.[18] To what extent seedlings

FIGURE 3. Branch and flower buds of the clove tree, *caryophyllum*. Georgius Rumphius (1627–1702), *Herbarii Amboinensis*, 1750 (II. 2. i).

were transplanted before the sixteenth century is unclear. Likewise, the idea that the center of speciation was the island of Makian is possibly correct, but difficult to demonstrate. There is in fact very little genetic diversity within the home territory. Here, Rumphius observed, trees started to flower after seven or eight years, in Amboina after ten or twelve years,[19] the latter a measure of their relatively recent introduction. They remain fruitful for up to about seventy years. Trees unharvested for three years were said "to run wild...and the yield thereafter is worthless."

The clove is propagated from fallen fruit and by transplanting seedlings. Birds consume the fruit and discharge the seed and thereby contribute to the processes of dispersal. In the middle of the nineteenth century, and probably long before, ceremonies were performed to ensure fertility and guarantee a good harvest. When in blossom the trees were "treated like pregnant women: no noise may be made near them; no light or fire may be carried past them at night; no one may approach them with his hat on, all must uncover in their presence. These precautions are observed lest the tree should be alarmed and bear no fruit, or should drop its fruit too soon...."[20]

Cloves need good drainage, a rich loamy soil, and a continuously warm, humid climate (approximately 150 centimeters of rain annually). Small volcanic islands, such as the northern Moluccas, are ideal. In the words of Pigafetta, "[cloves] grow only in the mountains [up to about 600 meters]...and if one of these trees is planted in the low ground...it dies;...we saw almost every day a cloud descend and encircle first one of these mountains and then the other, whereby the cloves become more perfect."[21] Garcia da Orta learnt that "they do not grow very near the sea, but a cannon shot distant from it, though on islands surrounded by the sea."[22] Rumphius emphasised the need for "the shade of other trees, but not dense shade."[23] Cloves flourish in company with the lofty, nut-bearing *kanari* (*Canarium commune*), the so-called Java almond. Heavy undergrowth leads to a deterioration in yield.

Yield and Preparation

The number of clove buds varies considerably from year to year, with a tendency to a bumper crop (up to 75 pounds weight per tree)[24] every third or fourth year, the so-called *musim* or monsoon. The fullest early description of harvesting comes from António Galvão's *Historia das Moluccas* (1544):

> [The islanders] eat before they harvest [the clove] because it causes a strong nausea. As soon as it begins to ripen, they gather it; for if they let it attain ripeness, it becomes woody and falls without being of any use. The harvesters

> climb up the trees and take with them a rope and a pole. They throw the rope down, and those who are standing there tie a basket to it, and it is hoisted up. And they fasten it with some cord around their shoulders, and thus it stays on their back. They pick the clove with their hands, breaking the ends of the boughs bearing it, and throw it into the *saloi*. Where their hand cannot reach, they substitute the pole for it; and when the basket is filled they send it back down the rope. They bring it to their houses, and they put it to dry on mats in the sun or on reeds in the smoke as [one does with] chestnuts.[25]

Cloves that have not been properly dried lose weight by dehydration in transit to the disadvantage of the merchant.

Tomé Pires reported that there were six harvests each year or almost continuous harvesting.[26] He put the total annual production from the five islands at about 6000 [Moluccan] *bahars*[27]—"sometimes a thousand more, or a thousand less." Makian (1500 b.), Tidore (ca. 1400 b.), and Moti (1200 b.) were the principal producers or, more accurately, exporters.[28] Makian had the best harbor (Figure 4). From the early fifteenth century, the greater part of the crop must have passed through Malacca, whether en route for India and the West, or for mainland South East Asia and China. A small fraction was used in central and western Indonesia, but only a minute amount in the Moluccas themselves. Here the aromatic clove buds do not appear to have been appreciated.[29] The fruit was sometimes made into a conserve with sugar or pickled with salt and vinegar, for which there was a market in Malacca and India.[30] Exactly how the buds came to be exploited in the first place, more than a millennium before the arrival of Europeans, is a matter of conjecture. Something as strongly aromatic as the flowering clove (and indeed the nutmeg) would hardly be ignored by merchant venturers in touch with more developed societies and potential centers of demand. Da Orta relates how, sailing between Cochin and Goa, he picked up the "strong and delicious scent" from another ship coming from *Maluco* with a cargo of cloves.[31]

THE NUTMEG: *Myristica fragrans*

Description and Distribution

As the source of a "double spice," consisting of a seed (nutmeg) and an *arillus* or mantle (mace), *M. fragrans* is unique. "The fruit is the nut; over it spreads the mace like a flower, and above that again another thick rind," to quote Duarte Barbosa.[32] Garcia da Orta thought that the tree itself (Figures 5 and 6) resembled a small peach.[33] It usually grows to a height of 40 to 45 feet and should flourish for between 60 and 80 years. The ripe fruit, which looks rather

FIGURE 4. *Secret Atlas of the United Dutch East India Company.* Makian, ca. 1620.

FIGURE 5. The nutmeg tree, *noce moscata*...Christoval Acosta *Trattato...della historia, natura, et virtu delle Droghe medicinali, et altri semplici dalle Indie Orientali in Europa*....Venetia, 1585 (Burgos, 1578).

like a nectarine, splits along a lateral furrow, exposing the crimson aril and the brown seed.

The center of cultivation of *M. fragrans* has been the Banda (Malay *Bandan*) group of volcanic islands—chiefly Lontor, Neira (Figure 7), Gunung Api, Ai, Run, and Rozengain—for as far back in time as evidence survives. At the beginning of the sixteenth century, mace was concentrated for export on Lontor

FIGURE 6. Branch and fruit of the nutmeg tree, *Nux Myristica*. Georgius Rumphius (1627–1702), *Herbarii Amboinensis*, 1750 (II. 5. iv).

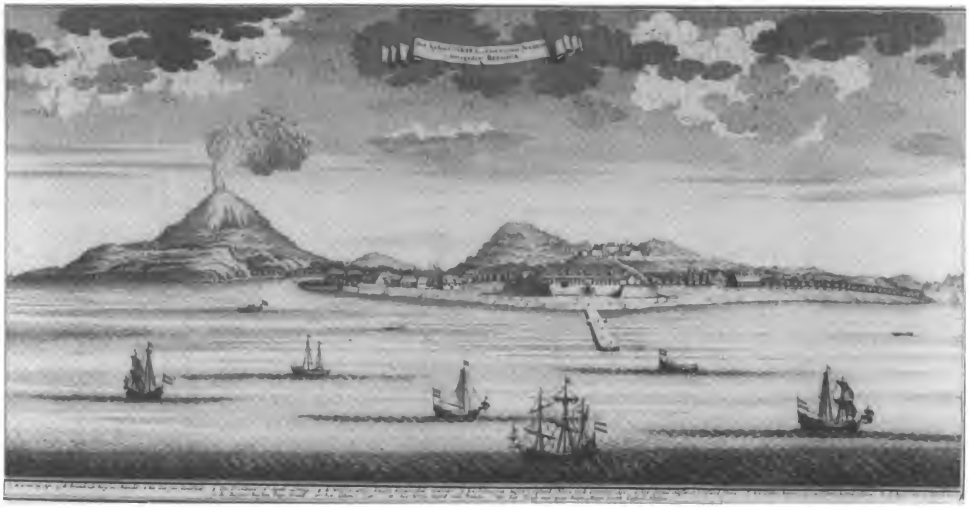


FIGURE 7. The island of Neira, Banda group. Fort Nassau, center foreground; Fort Belgica on the hill, behind; *Gunung Api* (mountain of fire), left. François Valentijn *Oud en Nieuw Oost-Indiën,* 1724–1726: IV [after Izaak Commelin (ed.) *Begin ende Voortgang ... Oost-Indische Compagnie,* 1646: I.]

(Pulo Banda) and Neira.[34] Wild forms of the species are said to exist in the Moluccas proper, Halmahera, Ceram, Buru, and western New Guinea.[35] However, other species of *Myristica*, in all about 80, are widely distributed, including the Malay peninsula,[36] the greater part of the Indonesian archipelago, and the Philippines,[37] and it is by no means always certain that reports of *M. fragrans* are genuine. In India, *M. malabarica*,[38] one of about 20 indigenous species but with little fragrance, appears to have been exploited until the nuts of *fragrans* were imported.

M. fragrans has been cultivated at different times in various parts of South East Asia.[39] Its distribution, unlike that of the clove, is still predominantly Indonesian.[40] Some reports of wild nutmegs may therefore refer to feral specimens of *fragrans*, rather than to truly wild, related species. In and around Banda, and probably farther afield, the nutmeg (like the clove) has been disseminated by birds, notably pigeons (*Ducula* [formerly *Columba*] *perspicillata* and *D.* [formerly *Carpophaga*] *concinna*) that digest the mace and deposit the nut. John Ovington (1689) heard that deliberately planted nutmegs never thrived, but thought that "this may be a subtle contriv'd story of the Dutch, to keep men from endeavouring to transplant them."[41]

Beyond South East Asia, attempts have been made to introduce *M. fragrans* to most of the tropical locations that have, at one time or other, received the clove,[42] but with generally less success. Reports of cultivation in southern China by the eleventh century are controversial. A tree or plant (*i-chih-tzu*) in Chi Han's fourth-century *Flora*, there said to grow in Chiao and Ho-p'u (Annam to southwestern China), has been identified by a recent editor and translator as nutmeg, *M. fragrans*.[43] Chi Han's description is, however, far from convincing. The nutmeg is often confused with the cardamom in the Chinese literature (*infra* p. 22). An illustration of the genuine nutmeg (*ju-tou-k'ou*) in the same edition of the *Flora* is not part of the historic text, but taken, like all the other illustrations, from the 1249 edition of a Sung *materia medica* of the late eleventh century.

Biology and Ecology

Fragrans, as the name implies, is by far the most aromatic of the species of *Myristica* and, like the clove, the strength of the aroma increases with cultivation. *M. fragrans* is dioecious, the flowers either male or female with pistils and stamens on different trees, but often becomes less so over time. A ratio of between 1:10 and 1:20 is sufficient for purposes of pollination by insects.[44] Higher or lower ratios are either unsatisfactory or wasteful, which probably impeded the early phases of dispersal. Trees begin to bear fruit after about nine or ten

years, then flower more or less continuously. Individual specimens may, at any one time, carry fruits at every stage of growth. They mature in about nine months. Up to eight races of *fragrans* have been recognized,[45] presumably the result of isolation and artificial protection.

The environmental requirements of the nutmeg are similar to those of the clove: a rich, well-drained volcanic soil, continuously high temperatures, matching atmospheric moisture (rain in most months), and the kind of thin shade provided by *kanari* trees.

Yield and Preparation

Trees usually yield 10 to 14 pounds of nutmeg and mace annually, altogether about two thousand fruits. Mace has been consistently the more highly valued on world markets. Da Orta (1563), in Goa, put the ratio at a relatively modest 1:3, "well known to those who come from Banda."[46] Other estimates[47] are 1:7 (ca. 1515) and 1:10 (1603). Pires says that the Bandanese would only sell a *bahar* (about 450 pounds' weight) of mace if seven *bahars* of nutmeg also were purchased. At the beginning of the sixteenth century, mace and cloves were of approximately equal value, but by 1603 mace had edged ahead (7:10).[48]

Whole fruits are harvested by hand and with the aid of a pronged collecting rod.[49] The fleshy pericarp is removed, the mace peeled off, and the nuts dried in the sun for a few days and then over a smouldering fire for two to three months. Mace too is dried or cured in the sun, changing color from crimson to yellow. Again like the clove, the flesh of the fruit was sometimes preserved in vinegar or, adding sugar, made into a conserve, which had "a pleasant scent [and was] very good for the brain and for nervous complaints."[50] Rumphius was fond of this "marmalade," which perhaps was originally prepared by expatriate Chinese.[51]

SANDALWOOD: *Santalum album*

Description and Distribution

Sandalwood is "a small, evergreen tree, [with] slender, drooping branchlets, sapwood white and scentless, heartwood yellowish-brown [and] strongly scented."[52] It is also parasitic, drawing nutrients from the roots of adjacent trees. The close-grained heartwood (*sāra*), which alone has commercial value, begins to form in about the tenth year of growth and is obtained, not only from the trunk, but from branches (Figure 8) and roots of 1 inch or more in diame-

FIGURE 8. Branch of the sandalwood tree, *Sandalum*. Georgius Rumphius (1627–1702), *Herbarii Amboinensis,* 1750 (II. 16. xi).

ter. Trees mature in about 20 years, when the heartwood is within 2 inches of the surface of the trunk.

Santalum album is indigenous between eastern Java and Timor, including all the Lesser Sunda Islands. Soemba (Sumba) was formerly known as *Chandane* or Sandalwood Island but was never, apparently, the principal supplier. The quality of the wood increases from west to east,[53] which seems to be related to the progressively longer dry season. Da Orta reported that yellow sandalwood was more abundant "in parts much exposed to the sun."[54] The comparatively restricted homeland of *S. album* lies adjacent to another of vast extent, between central Australia and Hawaii, where the remaining two dozen or so species of *Santalum*, all more or less fragrant, are native.[55] Sandalwood (*S. freycinetianum, S. pyrularium, S. marchionense*) was first collected in the Hawaiian Islands in the late 1770s.

In earlier times, exploitation centered upon Timor. Pigafetta (1521) believed that here "and nowhere else is found white sandalwood."[56] Da Orta states, more cautiously, that it grew in Timor "where it is in greatest quantity and is called *chandam* and is known by that name in all the lands around Malacca."[57] He makes the neat, but only broad, distinction between red sandalwood (*Pterocarpus santalinus*) growing to the west of the Ganges and "white and yellow sandal [*S. album*] beyond the Ganges."[58] The scented *Pterocarpus indicus* is native to the Malaysian archipelago. Kosmas Indikopleustes in the sixth century noted that *Taprobanē* (Sri Lanka) obtained silk, aloes, cloves, and sandalwood, presumably white or yellow, from the East ("Tzinista and other trading places") and that some were shipped to marts in Malabar.[59] By stages, such products ultimately reached the West. China drew supplies from entrepôts in Fu-nan and Nam Viet.

Santalum album was for long generally assumed also to be native to southern India, chiefly Mysore and Malabar,[60] notwithstanding the distance of three thousand miles between there and eastern Indonesia. Sandalwood, however, is not mentioned in Rheede's comprehensive *Hortus Indicus Malabaricus* (1678–1703).[61] Duarte Barbosa (ca. 1518) nowhere states that it grew in India, but rather in Timor, where there was "an abundance...which the Moors [Muslims] in India and Persia value greatly, where much of it is used. In Malabar, Narsinga and Cambay it is much esteemed."[62] Sandalwood was shipped as "principal merchandise" from Malacca to Cambay by the Gujarātīs and to *Bonuaquelim* (east-central India) by the Klings (Kalingas).[63] The Chinese between the thirteenth and fifteenth centuries brought it to Calicut,[64] again probably from Malacca. It "all [came] from the island of Timor," according to the Venetian Cesare Fedrici (1560s),[65] who knew India and the East Indies at least as far as Banda. Ralph Fitch (ca. 1590), the first Englishman to visit mainland

South East Asia, reported from Malacca that the white *sandal* of Timor was "in great request among the Indians."[66] Likewise, Jan Huyghen van Linschoten (1596), a factor at Goa for the Fuggers and Welsers of Augsburg, affirmed that white and yellow sandalwood mostly came from *Tymor*, "and from thence it is carried throughout all India and other countries...."[67]

C.E.C. Fischer in the 1920s and 1930s first seriously questioned whether sandalwood was indigenous in India. He put forward good reasons for suggesting that it had been introduced. The foundations of his case rested on perceived anomalies in the distribution and record of expansion of *S. album* within India from about 1780 (the date of Francis Buchanan's account of Mysore) to his own day. Sandalwood, although it reproduces freely from seed and is "hardy and adaptable," had not occupied all the areas that one would have expected if the species were indigenous:

> in Coimbatore, as in the conterminous parts of Mysore, the tree occurs (or occurred in 1905–1907) only in the vicinity of existing villages or abandoned village sites, mainly in hedgerows and thickets. As one went further from such centers the sandal thinned out, became rarer and rarer till it disappeared altogether, though all the conditions appeared identical. The contrary is what one would expect if the species were truly indigenous, because cattle are exceedingly fond of sandal leaves and are apt to destroy the plants and cattle aggregate around the villages. This also explains why the plants are found almost confined to the thickets and hedgerows, because it is there that they find some protection from the cattle.[68]

Fischer concluded that "introduction must have taken place at a very early date, possibly a pre-Christian one."[69] If so, it is questionable whether there would not have been more than sufficient time for "all suitable sites" to be occupied long before the eighteenth century, particularly since sandalwood clearly was in demand among those in a position to encourage its expansion—rulers, monasteries, and temples.[70]

The probability is that the species was deliberately introduced in different places at different times, with mixed success. How early cannot be determined, for little or no proof exists in ancient or medieval sources of *S. album* actually growing in India. Sanskrit *candana* (= Dravidian *cāntam*) came to refer to sandalwood, but we cannot be sure that this, or some other aromatic wood, was the original meaning. Several products of South or South East Asian origin have been used as substitutes for sandalwood, including *Urandra corniculata*,[71] a heavy, scented wood, and *Aquilaria agallocha*,[72] gharuwood. From India itself, Da Orta recorded that "Malayalims [Malayalams] ... say that they have a scented wood which is like white sandal ... they call it *sambarane*"[73] (*sāmbrāṇi* = *Styrax benzoin*, gum benzoin).

Even if *candana* is always sandalwood, early references could be satisfactorily explained by imports, only gradually supplemented, and finally largely replaced by home supplies. The latter never seem to have been the basis for any considerable export trade in sandalwood, up to and including the early operations of the European East India Companies. Sandalwood regularly passed through Indian ports on its way to the Levant. If the wood was shipped from *Barugaza* (Broach) to Apologos on the Persian Gulf around the beginning of the first millennium (*infra* p. 114), there is no indication that it originated in India rather than some part of South East Asia.

Garcia da Orta saw sandalwood at a "pleasure house" in Ahmednagar (Bombay), "where it was brought to be sown."[74] In Abū'l Fazl-i-'Allāmī's *Mode of Government of Akbar* (ca. 1590), we read that sandalwood (*chandan*) "grows in China"—that is the Far East—but "during the present reign (1556–1605) it has been successfully planted in India."[75] Apparently this was only one of many such introductions, stretching back at least to the middle of the first millennium. The *Weï-shu* (386–550) records that white *chön-t'an* was a product of southern India.[76] Early allusions to sandalwood growing in India (*Malaya*) and in islands to the east (*Suvarṇabhūmi*) are considered below. Both locations were probably correct, supplies from the East being the more important the further back in time we go. Demand in India, Indianized South East Asia, and China rose steadily in medieval times.[77] The shipment of cut sandalwood and of seeds or seedlings for propagation were facilitated and to some extent prompted by the presence of temples and monasteries throughout the archipelago where the aromatic wood was in daily use.

Biology and Ecology

The fact that sandalwood is a root parasite must have delayed and often prevented successful introduction and subsequent expansion. Seedlings can live independently for only a brief period of time and must then be attached to the roots of a host. Potential hosts are quite numerous,[78] but not all are equally suitable at different stages of growth, and some are poisonous.[79] *S. album* is also susceptible to a virus infection (spike disease) unknown outside India, which is invariably fatal. When seedlings are artificially planted today, suitable hosts also are provided. As the tree gets older, it requires larger hosts—from grasses to herbs, to shrubs, and then to substantial trees. Seedlings are often destroyed by rodents, grazing animals, and fire. Seeds from mature specimens attract birds.

Sandalwood varies in quality with the prevailing ecological conditions. High oil content is associated with well-drained, rocky ferruginous soils and a trop-

ical climate with a distinct and fairly lengthy dry season. Fertile soils and year-round and heavier rainfall promote rapid growth and lead to larger trees, but less heartwood and less oil. Comparatively open, sloping ground is preferred, with plentiful hosts, but limited tall-tree competition.

Clearly, it would be exceptional for all these conditions—biological and ecological—to be met in new colonial situations, whether in India or elsewhere. While some who attempted introduction, necessarily from seed, may have had first-hand knowledge of sandalwood's place of origin, they probably did not appreciate the relative importance of all the physical conditions and particularly the nature of parasitism. We must therefore envisage many introductions and a very uneven pattern of success, and all more by chance than design.

Yield and Preparation

Sandalwood is most profitably felled when fully mature, that is after 20 years or so. Chau Ju-kua (ca. 1225) knew that "the best quality is derived from old trees, when the bark is thin and the full proportion of fragrance is contained in [the heartwood]."[80] Pigafetta (1521–1522) preserved the following legend:

> The peoples [of Timor] are heathen, and when they go to cut sandalwood (as they told us) the devil appears in divers forms, who tells them, if they have need of anything, to demand it of him. Because of this apparition they are sick for some days. The sandalwood is cut at a certain phase of the moon, for otherwise it would not be good.[81]

The effect of these beliefs would have been to control or reduce any tendency for excessive cutting. Until the early eighteenth century, the Portuguese exploited sandalwood from a base on the small island of Solor, visiting Timor only periodically.[82] The principal port of call was *Lifao* (Okusi Ambeno).

After felling, the bark and the sapwood are stripped off and the heartwood, about one-third of the tree by weight, cut into billets. These are usually then stored under cover or dried in the shade,[83] supposedly to improve the aroma. Large numbers are burnt on ceremonial occasions. Much is also powdered and made up into a paste or unguent, usually in combination with other substances. An oil is distilled from chips and raspings and especially from chopped roots. The wood is close grained and the oil of low volatility; consequently the process is long and relatively expensive. The earliest known reference to the oil is in the *Mahābhārata* (? fourth century B.C.) "on the occasion of a Tamil king offering *Malayan* [South West Indian] products, consisting of sandalwood oil in golden vessels, when attending the enthronement of the legendary Pāṇḍya King Yudhiṣṭhira."[84]

SCIENTIFIC NOMENCLATURE

Clove

The history of the scientific nomenclature of the clove is unusually involved, even confused. Fortunately, this confusion recently attracted the attention of two taxonomists, upon whom we now can rely. The species has been assigned to no less than five genera: *Caryophyllus, Eugenia, Myrtus, Jambosa,* and *Syzygium*. The common Latin name is *caryophyllus* (Greek *karyophyllon*). According to A. A. Bullock and S. G. Harrison, there are three legitimate scientific names: *Jambosa caryophyllus* (1893), *Syzygium aromaticum* (1939), and *Eugenia caryophyllus* (1958–1959). The "correct one depends on the classification adopted."[85] The authors themselves placed the species under *Eugenia*, a genus of the Family Myrtaceae. "Opinions differ as to whether ['wild cloves'] should be regarded as conspecific or whether [they] should be separated as *E. obtusifolia*."[86]

Eugenia, named for Prince Eugene of Savoy (1663–1736), patron of botany, was coined by Pier Micheli in 1729[87] and validly published by Linnaeus in 1753.[88] For the clove, however, Linnaeus used *Caryophyllus aromaticus*,[89] following Kaspar Bauhin (1623)[90]—the first to introduce a binomial system of botanical nomenclature—and Leonard Plukenet (1641).[91]

Nutmeg

The generic name *Myristica* (myrrh-scented) was employed by Linnaeus (1742),[92] but first validly published by J. F. Gronovius (1755).[93] Martin Houttuyn established the species *Myristica fragrans* (1774).[94] Other, later specific names—*officinalis*, *moschata*, and *aromatica* have now been discarded.[95–97]

Most earlier binomials followed the classical description *Nux moschata* (musk-scented) or *Nux myristica*; sometimes both are given, commencing with Joannes de Ruellius (1536).[98] Exceptionally, William Turner (1538) and Konrad Gesner (1541) have *Moschocarion* or *Moschocaridion*, Gabriel Fallopius (d. 1562) *Nuce mirepsica*, and Johann Bauhin (d. 1613) and Leonard Plukenet *Nux aromatica* (1641, 1696).[99–101] G. E. Rumphius (d. 1702) gave *Nux myristica* (Figure 6) in his *Herbarii Amboinensis*.[102] F. A.W. G. Miquel cited *M. fragrans* in the large and authoritative *Flora van nederlandsch Indië* (1855–).[103]

Sandalwood

Linnaeus's *Santalum album* (1753)[104] in the Family Santalaceae has rarely been challenged.[105] In fact, Linnaeus borrowed from Kaspar Bauhin (1623).[106]

Rumphius's *Sandalum Album Timorense*[107] (Figure 8) was undoubtedly sandalwood; similarly Bontius's (d. 1631) *Sandalo* (Timor) in his *De Medicina Indorum*,[108] a "pioneer work on tropical medicine."[109] Botanists or natural historians in the first half of the sixteenth century—Joannes de Ruellius, Konrad Gesner, Jacobo Silvius[110–112]—referred to "three kinds" of *Santalum*, including *rubrum*, which belongs to a different genus (*Pterocarpus*). Pharmacologists of the seventeenth century followed suit.[113]

FOLK NOMENCLATURE

Clove

The earlier of two Chinese names for the clove was *chi-shê-hsiang* (chicken tongue perfume), apparently from the shape of the dried buds. *Chi-shê* first appears in a work by K'ang T'ai (third century), where it is said to have come from *Ma-wu*, to the east of Fu-nan.[114] *Chi-shê-hsiang* also is included in a fourth-century *Flora* of the 'Southern Regions'—southwestern China and central and northern Vietnam (Chiao-chou). The compiler, Chi Han, failed however to distinguish the species from the *mi-hsiang* tree (*Aquilaria agallocha*), gharuwood, native to Chiao-chou.[115] Cloves were almost certainly imported. That they came from somewhere in the Indonesian archipelago would have been known in Chiao-chih, but not necessarily to Chi Han who worked in Hsiang-yang (Hupei, central China). The inhabitants of Fu-nan preserved a tradition that five aromatic substances came from a single tree, including gharuwood from the knots and cloves from the flowers.[116]

The other Chinese name for cloves, *ting-hsiang* (nail-like perfume)—"because they resemble in shape the Chinese character *ting* (丁, 'a nail')"[117]—seems to have been adopted in the fifth or sixth century.[118] It was earlier used to describe the flowers and aroma of native species of lilac.[119] I-Tsing (ca. 672) reported that "two kinds of cloves" grew in Pulo Condore (*K'u[n]-lun* island), off the coast of southern Fu-nan: *ting-tzŭ-hsiang* and *mo-ting-hsiang* (mother cloves),[120] the latter presumably used in confections.[121] The statement cannot be taken as proof that cloves had been introduced to Pulo Condore, but rather that they passed through southern Fu-nan on their way to China. The *ting-hsiang* is shown and named in "the earliest known [Chinese] illustrated herbal in the printed form," published in 1062 [1249].[122] It is also the name used in Li Shih-chen's famous materia medica *Pen Ts'ao Kang Mu* of 1596.[123]

Ting-hsiang is the origin of one name for clove throughout the Malay peninsula and archipelago—Malay, Javanese, and Balinese *chĕngkeh*, more fully

buah (fruit) or *bunga* (flower) *chĕngkeh*.[124] Pigafetta (1521) has *chianche* (in Malacca) and *chiande* (in Cebu),[125] and Rumphius *tsjencke*.[126] In the Moluccas we find (in addition to an apparently indigenous name *ghomode*[127]) *ghianche*[128] or *chanque* ("in *Maluco* ... and all that region"[129]). Many other islands in the archipelago have similar names.[130] Thomas Forrest (1779) recorded *chinky* from Papua.[131]

The adoption of names based on *ting-hsiang* presumably reflects Chinese participation in the trade in cloves (perhaps from the fifth or sixth century); *chi-shê-hsiang* indicates only that cloves were known in China and probably obtained by way of Fu-nan. The latter (earlier) name was not "exported," except possibly to Japan (*chōji*), Tibet (*li-ši*) and Mongolia (*lišï*).[132–134] Names in mainland South East Asia appear to be unrelated: *kŏ'rbu* (Cham) and *klaṃpū* or *kraṃpū* (Khmer), *la-nyen-pwen* (Burmese), and *hoa cúa cây* (Vietnamese).[135–137]

Another set of names for clove incorporates the element *-lawa*. This was formerly thought to come from Sanskrit *lavaṅga* or *lavaṃga*, but it is more likely that the origin of both the regional names and the Sanskrit form lies in Old Malay and Old Javanese *lawaṅ*.[138] This is sometimes prefixed by *buah-* or *bunga-*. Rebello (ca. 1560) reported *būa lavoa* from the Moluccas.[139] Rumphius gives *bugulawan* and *bongulawan* as Ancient Malay, also a very similar name from Amboina, and *bobolawa* or *boalawa* in Ternate.[140] Bali has *bwah lawaṅg*.[141] Pigafetta found *bonghalanan* (= *bongalawan*) in Saranghani (Philippines).[142]

Variations on *-lawa* are at least as numerous as names derived from *ting* in the smaller islands of the archipelago.[143] The former is probably the older, only joined by *ting* from about the eighth century. Names incorporating *-lawa* pose another problem. In some important Dravidian languages (Tamil, Kannaḍa, Telugu) *lavaṅga, lawaṅga* or *ilavaṅkam* also means cinnamon.[144] Again, *lawang* can refer to *Cinnamomum* spp. in Malay; *kulit* (bark) *lawaṅg* = *C. culilawan*,[145] *chĕngkey hutan* is wild cinnamon.[146] The aromas of cinnamon and clove are rather similar and might be confused. In medieval Europe, clove leaves (*foglie di gherofani*) and clove bark were used as substitutes for cinnamon. Friar Jordanus, bishop of Malabar (ca. 1325), observed that the local cinnamon had fruit and flowers that resembled cloves.[147]

Cinnamon is one of the most important spices, with ancient centers of production in southern India and Sri Lanka (*Cinnamomum zeylanicum, C. tamala*) and China (*C. cassia*). If the bark and leaves of the clove tree were thought to be a kind of cinnamon, this may help to account for the discovery of the value of the buds in islands where the local population paid them little or no attention. In which case, *lawang* was probably first applied to cinnamon and then to cloves.

Nutmeg

The nutmeg is known as *pala* in Malay, Javanese (Indonesian), Balinese, Sundanese, Macassarese, and Buginese[148–152] (Sulawesi), in fact throughout much the greater part of the Malay peninsula and archipelago. *Pala* comes from Sanskrit *phala*—fruit (especially of trees) and the kernel and seed of fruit[153]—which in turn is a loan-word from Tamil *paṛam*.[154] Used alone, *pala* usually means nutmeg or nutmeg and mace. The smaller islands have many versions of the word: *palo, falo, paäla, pahalo, palang, parang, para, pal, pana, palalo, kapalo*.[155] For Banda, the chief source of nutmegs, Da Orta gives *pala* and *buna-pala* (mace), and Rumphius *pela* although there also was a native name, *galago*.[156–158] Ternate and Tidore had *gosora* and *gasori*,[159] or, according to Pigafetta, *buapala gosoga*.[160]

In the major South East Asian languages, *pala* is usually prefaced by *buah* (fruit=nutmeg) or by *bunga, bonga* or *kembang* (flower or blossom = mace) as far north as the Philippines.[161] The widespread notion that mace was the flower of the nutmeg was either a plain misapprehension, or by "flowers" we should understand a bed of petals. Ludovico di Varthema (1505), who may have been the first European to see the nutmeg *in situ*, observed that "before the nut arrives at perfection, the mace stands around [it] like an open rose, and when the nut is ripe the mace clasps it."[162] Duarte Barbosa (1518) expressed the same idea (*supra* p. 7).

The nutmeg was known in Chinese as *chia-kou-lê* (ca. 725) and later as *to-ku* (ca. 863).[163] *Jou* (fleshy) *-tou-k'ou* is the name in later sources, including the illustrated herbal of 1062 [1249].[164] *Tou-k'ou hua* is mace. The Chinese at first confused nutmeg with cardamom (*tou-k'ou, pai-tou-k'ou*, white cardamom),[165] doubtless on account of a resemblance between their fruits. Nutmeg was thus fleshy cardamom.[166] Both species are widely grown in private gardens. Just as the use of cinnamon may have led to the discovery of cloves, so one or other of the many cardamoms grown in South China and mainland South East Asia[167] probably predisposed the Chinese to the imported nutmeg.

Nomenclatural confusion between the two species is not limited to Chinese. Arabic *ḳāḳula* (cardamom)[168] seems to be derived from Sanskrit words for nutmeg: *kakkola* and *takkola*.[169] *Takkola* (Chinese *Ko-ku-lo*, Arabic *Kāḳula*) was a place or region on the west coast of Malaya,[170] which the Chinese from the eighth century thought produced both nutmegs and the round cardamom (*Amomum kepulaga*), the latter possibly introduced from Java.[171] Tibetan *dza-ti*[172] and Burmese *zadi-phu*[173] come directly from Sanskrit *jāti* [*-phala*].

Sandalwood

Sandalwood (*Santalum album*) in some quantity appears to have entered international trade earlier, probably several centuries earlier, than cloves or nutmeg. It is the only product of East Indonesian origin that is possibly mentioned in the *Periplus of the Erythraean Sea* (mid-first century A.D.), and it appears more frequently in the oldest Indian medical texts than either of the two spices. The Chinese probably obtained significant amounts of sandalwood at about the same time as the West, with the expansion eastward of Indian and specifically Buddhist influence around the beginning of the Christian era.

The names for sandalwood in South and East Asia are overwhelmingly derived from Sanskrit *candana*, which presumably displaced many local names. So far as is known, only two such names, *aikamenil* (Timor) and *ayasru* (Amboina) have been reported[174]—both from near the center of origin and of cultivation of the species.

Sanskrit *candana* is a loan-word from one of the Dravidian languages, such as Tamil *cāntam*. The name may have been originally applied to some other aromatic product, then attached to sandalwood when this was first encountered in Indonesia, or when the species was introduced to southern India. Both the Sanskrit/Dravidian word and the fact of the introduction, at whatever time, emphasize the high value placed on sandalwood in India, probably far greater than in Indonesia prior to the beginnings of Indianization.

The name *candana* is easily recognizable in the Malay peninsula and archipelago, at least as far east as Bali-Sulawesi: Malay *cĕndana,* Javanese, Old Javanese, Sundanese, Macassarese and Buginese (Sulawesi) *candana*, and Balinese *ceṇḍana* or *cenana*.[175–177] A transliteration of *candana* "appears in China in 357, but only as the name of a country in the Indies; as the name of a tree it appears in 454."[178] *Chan* (or *chon* or *ch'en*) *t'an* is found in Chinese Buddhist texts.[179] This was truncated to simply *t'an*,[180] or amplified as *t'an-hsiang* (*hsiang* = fragrance).[181] *Pai-t'an-hsiang* is white *t'an*-fragrance (*S. album*), as opposed to *tzū(tze)-t'an,* odorless red sandalwood (*Pterocarpus santalinus*).[182] In Tibetan, sandalwood is *tsan tan*, in Cham *chandal*, in Thai *chantana*, in Burmese *sandakú*.[183–186] Vietnamese *cây* (tree)-*bạch-dàn*,[187] and Japanese *byakundan*[188] each appears to include a Sanskrit element.

The names for white and red sandalwood almost invariably have the same Sanskrit root, with an adjectival prefix, at least in the case of the latter, thus *candana*, more specifically *śveta-candana* and *rakta candana*. Once discovered by advanced societies, sandalwood, like camphor, traveled relatively quickly around the Old World. Names given in India or in the Indianized East tended

to be adopted and then only slightly modified, with kinship evident from China to the shores of the Atlantic.

Discovery of the Moluccas by Europeans

European travelers to South East Asia before 1500 were few in number and none, with the qualified exception of Nicolò de' Conti, mentions the Moluccas. Marco Polo, who called at Sumatra on his return journey to Europe (1292–1295), reported that Java had "nutmegs and cloves and other kinds of spices."[189] Another Italian, the Franciscan Odoric of Pordenone (1316–1330) reached Java itself, which, he says, produced camphor and nutmegs.[190] On the *Catalan Atlas* (1375–1381), *Illa Iana* (placed roughly in the position of Sri Lanka) is said to have *nou muscada, macis, sandels*, and *camphora*[191] (Figure 9). The legend, however, appears to belong to *Illa Trapobana* on the eastern extremity of the world map, corresponding to Sumatra. Sri Lanka and Sumatra were often confused in medieval sources. In any event, cloves and nutmegs and sandalwood were merely available in the ports of Java and Sumatra. At the time, however, this may have been difficult to appreciate, if indeed the distinction between what was produced locally and what was traded was regarded as significant. Arab and Chinese commentators displayed the same indifference or lack of precision.

Europe's first glimpse of the Moluccas, through the eyes of Europeans, came with the exploits, real or imaginary, of two Italian adventurers, the Venetian Nicolò de' Conti in the first half of the fifteenth century and the Bolognese Ludovico di Varthema in the first decade of the sixteenth century. The important role of Italians in the initial exploration of both the East and the West Indies is perhaps insufficiently appreciated.

Nicolò de' Conti's lengthy travels in the East (1419–1444) were recorded, in part, by Poggio Bracciolini (1380–1459). "Fifteen days' sail beyond [Java]," we are told, "two other [islands] are found: the one is called *Sandai* [? Ptolemy's *Sindai*[192]] in which nutmegs and maces grow; the other is called *Bandam*; this is the only island in which cloves grow, which are exported hence to the Java islands."[193] Six hundred years earlier, Ibn Khurdādhbeh had put the "land where spices grow," fifteen days' sailing to the east of *Salāhiṭ* (Strait of Malacca). *Bandam* was certainly Banda, where cloves (from the Moluccas) were regularly collected[194] before being shipped, along with locally grown nutmegs, to Java. The pattern of winds made a voyage to the Moluccas from Java much more difficult than a voyage to Banda.

Sandai cannot be satisfactorily identified[195]—possibly it is Sunda, or Sangihe (north of the northeastern peninsula of Sulawesi), or Banggai Island (eastern

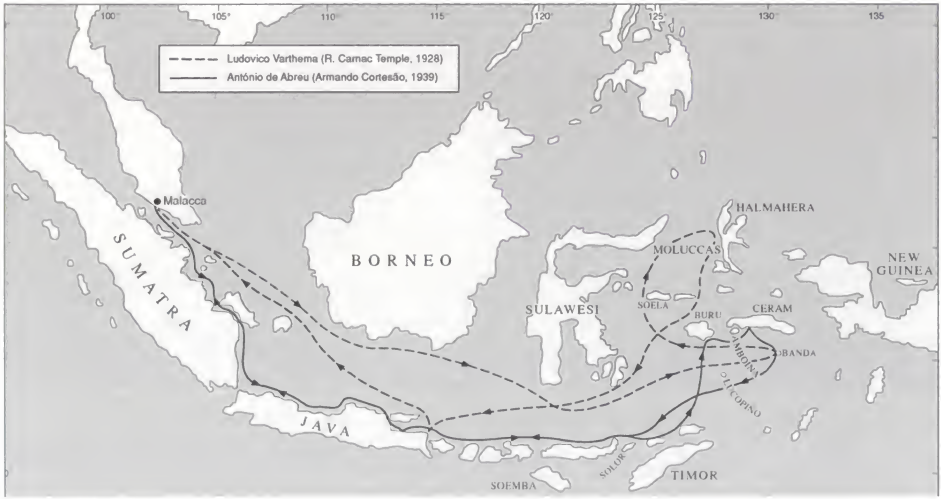
FIGURE 9. Part of the Catalan World Map of Abraham Cresques, ca. 1375 (1977: Taf.6). *Illa Iana* (Java, in fact Sumatra, in the position of Sri Lanka) with *nou muscada* (nutmeg), *macis* (mace), *sandels* (sandalwood), and *camphora* (camphor) among the local or regional products, and a Chinese junk to one side of the caption.

Sulawesi), or the *Insula Candyn* of Behaim's globe (1492), or again *Seke* (*Seque*) of Galvão (1544) and Barros (1563).[196–198] There can be no reasonable doubt that de' Conti was referring to the Moluccas, however disguised. His statements were incorporated in two world maps, both Italian and of roughly the same date. First, an anonymous Genoese production of 1457, where *Sanday* is labelled "nuces muscatas et macis" and *Bandam* "garafalorum copiam ad Javas transmittunt."[199] Second, Fra Mauro's great *Mappa Mundi* of 1459, drawn in Murano (Venice), has legends that are essentially the same.[200] On Martin Behaim's globe of 1492, it is stated, correctly, that spices (*gariofilli negel, muscat*) were brought to *Insula Jaua Maior* from unnamed islands to the east and then "distributed throughout the world, for which many merchants are generally to be found there."[201]

Ludovico Varthema, the second and more controversial adventurer, published his *Travels* (1503–1508) in Rome in 1510, about a year before the Portuguese took Malacca and quickly launched the first of many expeditions to the Moluccas. Varthema claimed that he voyaged southeastward from Malacca (Map 1) along the northern seaboard of the Greater and Lesser Sunda Islands, as far as *Bandan* and then north to *Monoch*,[202] from which he returned to Malacca by approximately the same route. He provided quite detailed and tolerably accurate descriptions of the nutmeg (on *Bandan*) and the clove (on *Monoch*, probably either Ternate or Tidore).

The *Itinerario* proved to be a great success, running to many editions, in Italian, Latin (1511–), German (1515–), Spanish (1520–), French (1556–), Dutch (1563–), and English (1577–). Europeans were generally more impressed by the discovery of the all-sea passage to the legendary East than by Columbus's "Other World." Inevitably, however, Varthema's remarkable claims were later questioned. In particular, Garcia da Orta, resident of Goa for over thirty years (1534–ca. 1570) and influential author of *Colloquies on the Simples and Drugs of India* (1563), believed, or put it about, that Varthema "never went beyond Calicut and Cochin"; consequently, he gave the *Travels* "no credence."[203] Doubt has persisted to the present day[204] and probably can never be entirely removed. Certainly, there are surprising *lacunae* (as in the case of Marco Polo's *Travels*) and, in places, a certain vagueness in description, but this is true of virtually all medieval writing of a similar kind. Varthema's dates of arrival at and departure from various places are broadly acceptable.[205] There are inaccuracies in the narrative, but no egregious errors. Writing of cloves, nutmeg, and camphor, the author compares well with Ibn Baṭṭūṭa who, alone among the Arab writers, had first-hand experience of South East Asia (but not of the Moluccas).[206] Again on these matters, the Italian is better informed than the esteemed Duarte Barbosa (1518), who admittedly wrote in Malabar, but after the first Portuguese expedition to the Moluccas (in fact, to Banda) had returned to Malacca (1512) and news of this had reached Goa. The *Itinerario* only suffers by comparison with Tomé Pires's masterpiece, the *Suma Oriental*, compiled in Malacca and India between 1512 and 1515 following extensive travels in the Indonesian archipelago. To reject Varthema's account, insofar as it relates to lands beyond the Bay of Bengal, as pure invention or, at best, compilation (itself no mean feat), creates more problems than it solves. The Indonesian leg of the journey was possible (indeed much traveled by local mariners and pilots), nothing invalidates it, and not much is prejudiced by accepting it.

Afonso Albuquerque, viceroy of the Portuguese Indies, captured Malacca in August 1511, and in December of the same year despatched three vessels to the Moluccas under the command of António de Abreu, with Francisco Serrão



MAP 1. Voyages of Ludovico Varthema (1505) and António de Abreu (1511–1512), Malacca to eastern Indonesia and return.

FIGURE 10. Eastern part of the East Indian Archipelago, including *Malluquo* and *Bamda*. Francisco Rodrigues, 1512–1515 (Pires and Rodrigues, 1944: 1: pl. XXVII).

as his deputy. The fleet, guided by Javanese pilots, again following the line of the Sundas (Map 1), reached the Banda group, then returned to Malacca (December 1512), bringing cloves and nutmegs.[207] On the return voyage, a junk (purchased in Banda to replace one of the original ships) under the command of Serrão was wrecked on the shoals of *Luçapinho* (Lucopino Islands, Banda Sea); from where Serrão and his companions found their way, or rather were taken, to Ternate in the Moluccas[208]—the first Europeans certainly to set foot there.

Serrão settled in Ternate, corresponded with his friend Ferdinand Magellan,[209] who was then in Malacca, and died about seven months before the survivors of Magellan's trans-Pacific expedition reached the Moluccas in November 1521. Serrão's letters (now lost) and Varthema's *Travels* helped to persuade Charles I to support Magellan's plans for an approach to the Moluccas from the east. Also important in this respect were the *Livro* and *portolani* of Francisco Rodrigues, "pilot major of the armada [commanded by De Abreu] that discovered Banda and the Moluccas" in 1512, who left Malacca for India early in January 1513, two months or so before the first of Serrão's letters arrived. Folio XXXVII of Rodrigues's charts shows the eastern part of the East Indian Archipelago (Figure 10), including several small islands labelled (in Portuguese) "Islands of Banda (*Bamda*) where the maces grow" and, to the north, "these four islands, coloured blue, are those of *Malluquo*, where the clove grows." This and any other *portolani* from later voyages[210] that found their way back to Europe were used by the cartographers of Lisbon and Seville who were then attempting to establish or reinforce the conflicting claims of their respective sovereigns. The first ships under the command of a Portuguese, Álvaro Coelho, to reach the Moluccas (Ternate) from Malacca arrived in 1515 and returned laden with cloves.[211]

By the terms of the Treaty of Tordesillas (June 7, 1494), the boundary between the Spanish and Portuguese dominions was the meridian that lay 370 leagues to the west of the Cape Verde Islands—Portuguese territory to the east, Spanish to the west.[212] In the western hemisphere this ran through unmapped and uncontroversial Amazonian rain forest. On the other side of the world, however, there were unanticipated problems. The opposing meridian evidently lay near to the Moluccas, but the exact longitude was then impossible to determine and both contestants claimed advantage. King Manuel persuaded Pope Leo X in 1514 to issue a bull (*Praecelsae Devotionis*) confining the demarcation line to the western hemisphere and, at the same time, generally confirming Portugal's claim to the East Indies, known and unknown. Ferdinand Magellan, having defected to Spain in 1517, argued the Spanish case.[213]

FIGURE 11. Escutcheon and autograph of Sebastián del Cano (1522–1523). Observe the crossed sticks of cinnamon on a ground patterned with cloves and nutmegs.

Meanwhile in Lisbon and Seville, world maps were prepared that showed Banda and the Moluccas and, in most cases, named their characteristic products. At least seven such maps appeared between 1516 and the return of the *Vittoria* to San Lúcar de Barrameda, under the command of Sebastián del Cano, on September 6, 1522 (Figure 11).

The most productive of the great cartographers was Pedro Reinel who worked in Lisbon. His world map of 1516 (now in Paris) was the first to show the Moluccas (*Malucos Insul*).[214] Two more followed, in 1517 (Munich)[215] and ca. 1518 (London);[216] both associate the Moluccas with cloves (*clavo, cravo*) and Banda (*Ilhas de babay* or *babane*) with mace (*maccia, macas*), and both benefited from information gathered as a result of De Abreu's expedition. Pedro Reinel's son, Jorgé, moved to Seville early in 1519 and there produced another world map (ca. 1519, Munich),[217] apparently with the assistance—on the matter of the location of the Moluccas—of his father, who had gone to Seville to try

to persuade him to return to Portugal. This map was seen by the Portuguese factor in Seville, Sebastián Alvarez,[218] and probably also by Magellan, just before he set sail from San Lúcar on September twenty-first, 1519.[219] By the time the *Vittoria* was seen again, three further maps were completed, all of which showed the Moluccas, but added nothing new: one by Lopo Homem (1519, Paris),[220] another by Pedro Reinel (ca. 1520, Munich),[221] and an anonymous Portuguese production of the same year.[222]

The only eyewitness account of Magellan's expedition was prepared by Antonio Pigafetta for the king of Portugal. This was accompanied by 23 cartographic sketches,[223] one of which shows and names the Moluccas, along with the first (and rather good) drawing of a clove tree (Figure 1). An abridged version of Pigafetta's *Narrative* appeared in Paris in 1525, and two years earlier Maximillian of Transylvania's *De Moluccis Insulis*[224]—a letter written in October 1522 (printed in Cologne, January 1523) to the Cardinal Archbishop of Salzburg, based on information supplied by Del Cano and other survivors of Magellan's expedition, presumably including Pigafetta. This was the first publicly available news that Europeans had of the circumnavigation—one of the greatest, if not the greatest, feat of exploration, certainly of navigation, in the history of the world—and of the precise location of and current situation in the Spice Islands. Their ownership was, however, still in dispute. Two formal meetings between experts appointed by the royal contestants, in Badajos-Elvas in 1524 and 1526,[225] ended in deadlock for lack of accurate information. "The Portuguese were in a strait; if the line were pushed westward they might lose the Moluccas, if eastward they might lose Brazil."[226]

At the same time, further Spanish expeditions across the Pacific—by García Jofre de Loaiza from La Coruña and San Lúcar de Barrameda in 1525, and by Álvaro de Saavedra Cerón from Zacatula (Zihuatanejo) on the Río de las Balsas, western Mexico, in 1527[227]—proved, if anything, that to reach and exploit the Moluccas, *La Especiería*, by sailing westward, and then either return across the Pacific (which so far had proved impossible[228]) or complete a circumnavigation, was logistically and commercially untenable. Spain abandoned to Portugal its claim to the Moluccas by the Treaty of Saragossa in April 1529, in return for a payment of 350,000 ducats. Officially, this ended the dispute, but Spain never relinquished an ambition to extend its rule to the south of the Philippines (*Islas del Poniente*) and hostilities broke out from time to time in and around the Moluccas into the seventeenth century. After 1565, substantial quantities of spices reached Spain by way of Manila and Acapulco.[229]

FIGURE 12. World Map, Théodore de Bry, *Americae Pars VIII*, 1599. *Moluco Insulae* on the eastern margin.

The first map, discounting Pigafetta's sketches, to name the individual islands of the Moluccas was drawn in Spain by Nuño García de Terreño in 1522 and is now in Turin; another, draftsman unknown, followed ca. 1523–1524, also in Turin.[230] A *planisferio* by Diego Ribeiro, dated 1529 (Weimar) has, alongside Timor, "aqui ay mucho sandalo."[231] The first, anonymous Portuguese map to name the Moluccan islands individually did not appear until ca. 1540,[232] a prime example of the government's proverbial policy of secrecy. On the world map published by Théodore de Bry (1599) to illustrate Francis Drake's voyage around the world (1577–1580) only three islands or groups of islands in South East Asia are named: *Iaua maior* (Sumatra), *Iaua minor* (Java), and, most prominently, *Moluco ins* (Figure 12).

Notes

1 Pigafetta (ed. and trans. R. A. Skelton) 1969: p. 120.
2 Rumphius, 1750: 2: p.1.
3 Barbosa (ed. and trans. M. Longworth Dames) 1918–1921: 2: p. 202. Barbosa compared both the clove tree and the nutmeg tree (ibid: p. 197) to a bay tree.

4 Crawfurd, 1820: 3: p. 414.
5 Rebello (ed. A.B. de Sá) 1954–1958: 3: p. 363.
6 Pires [and Rodrigues] (ed. and trans. A. Cortesão) 1944: 1: pp. 208 [pl. XXVII], 212–213 n. 1. Neither Pires nor Rodrigues reached the Moluccas. Rodrigues got to Banda with the first (De Abreu) Portuguese expedition; for the Moluccas, he must have relied on oral information and possibly on charts available in Malacca (*infra* p. 29 and Figure 10).
7 Barbosa, 1918–1921: 2: pp. 199–200; Fernández de Oviedo y Valdés [1535] (ed. Juan Pérez de Tudela Bueso) 1959: 2: p. 296. On the indigenous names of the islands, see Barros (1563) 1777–1788: Dec. III (1): p. 567; Galvão [1544] (ed. and trans. H. Th. M. Jacobs) 1971: 2: pp. 329, 330 n. 7.
8 Pigafetta, 1969: 1: p. 121. *Mare* is named on Pigafetta's sketch map (Figure 1). Cf. Pires, 1944: 1: pp. 213, 221 ("this land of Gillolo [*Jeilolo*] has a great deal of wild cloves"). On the early distribution of the clove, see also Leirissa, 1979: pp. 311–312; Andaya, 1993a: p. 201.
9 According to F. Wit (in N.W. Simmonds ed., 1970: p. 216), "the nearest relative to the [cultivated] clove is a wild tree which is common in the forests on the lower mountain slopes in many islands of the Moluccas and in New Guinea."
10 Rumphius, 1750: 2: pp. 2–4; J. S. Stavorinus (ca. 1759) in Pinkerton (comp.) XI: 1812: p. 330 (to Amboina and Ceram just before the arrival of the Portuguese). Johan Nieuhof [1682] (1732/1988: p. 164) states that cloves grew wild in Amboina.
11 Pires, 1944: 1: p. 219.
12 Rumphius, 1750: 2: pp. 2–4.
13 Barrow (1792–1793) 1806: p. 188 (Batavia).
14 See, in particular, Ly-Tio-Fane, 1958, 1970 (Mauritius and Réunion). Apparently, attempts were made to introduce the clove tree to botanical gardens equipped with glasshouses in the Netherlands in the late 1680s (Heniger, 1986: p. 71).
15 According to Voigt [d. 1843] (1845: p. 48), the clove "not only not flowered in lower Bengal, but can scarcely be kept alive throughout the year."
16 Aiton, 1811: 3: p. 188.
17 G.G.C.J. van Steenis (ed.) 1950–1995: 4: p. xli; De Candolle [1886] 1964: p. 161 (Rumphius 2: tab. 3).
18 Orta [1563] (ed. Conde de Ficalho, trans. C. Markham) 1913: p. 218 (on the matter of cultivation, "no more than cleaning the ground where they collect the cloves"). Cf. Pigafetta (ca. 1522) 1969: p. 121 (watched over "without cultivating").
19 Rumphius, 1750: pp. 2–4.

20 Frazer (1913) 1990: 2: p. 28 (quoting field reports). See also Frazer's description (ibid: p. 100) of a fertility cult practiced in some parts of Amboina.
21 Pigafetta, 1969: 1: p. 121.
22 Orta, 1913: p. 218.
23 Rumphius, 1750: 2: pp. 2–4.
24 Silva, 1996: p. 259.
25 Galvão, 1971: 2: pp. 137–138. At the close of the sixteenth century, Jan Huyghen van Linschoten (trans. 1598, ed. A. Coke Burnell and P. A. Tiele, 1885: 2: pp. 81–82) stated that cloves were not picked by hand "but with ropes which they fasten about the branches and by force they shake [? break] them off." Stalks and clove buds were harvested together and thus shipped to Malacca and India; only "such as are to be sent to Portingall are severed [and clensed]." Cf. Crawfurd, 1820: 1: pp. 500–501.
26 Pires, 1944: 1: p. 216.
27 The *bahar* varied in value in different parts of East Asia and between different products. See Yule and Burnell *Hobson-Jobson* (1886) 1985: pp. 47–48; Villiers, 1981: p. 738 n. 70. R. A. Skelton (ed. and trans. Pigafetta, 1969: 1: p. 169 n. 10) put the *bahar* of cloves of Tidore in Pigafetta's time at about 450 pounds weight.
28 Pires, 1944: 1: pp. 217–218, adding (p. 219), "all the cloves from these five islands are of equal goodness if they are gathered when they are perfectly ripe"—meaning, when the buds are just ready for harvesting.
29 Orta (1563) 1913: p. 26; Crawfurd, 1820: 1: p. 497.
30 Orta (1563) 1913: p. 219; Paludanus in Huyghen van Linschoten [1596–1598] (ed. A. Coke Burnell and P. A. Tiele) 1885: 2: p. 83; Nieuhof (1682), 1732/1988: p. 164; Geoffroy (d. 1731) 1736: p. 326; Silva (1988) 1996: p. 260.
31 Orta (1563) 1913: p. 220. It was remarked that the smell of cloves in quantity was so strong that "people can be suffocated" (Fryke and Schewitzer [1675–1683], trans. 1700, ed. C. E. Fayle, 1929: p. 88).
32 Barbosa (ca. 1518) 1918–1921: 2: p. 197. In writing "when the blossoms open in the spring, they are taken off and dried in the sun," Chau Ju-kua [ca. 1225] (trans. F. Hirth and W.W. Rockhill, 1911: p. 210) appears to confuse the nutmeg and the clove.
33 Orta (1563) 1913: p. 273.
34 Pires (1512–1515) 1944: 1: pp. 205–206.
35 Pennant, 1800: p. 234.
36 Ridley *Flora*, 1922–1925: 3: p. 66 (ten species, *M. cinnamomea* "the only wild species ... in which the seed and aril have any spiciness").

37 Lamarck, 1783–ca. 1788: IV: pp. 385–391; Comyn, 1821: p. 26. William Dampier [1680s] (ed. J. Masefield, 1906: 1: p. 390) reported "wild nutmegs," with neither smell nor taste, on Pulo Condore off the coast of Indochina.

38 Khory and Katrak, 1903: 1: p. 523 (Travancore, northern Malabar, Concan, southern Canara); Brandis, 1906: p. 524 (Western Ghats).

39 Blanco [third ed.] 1877–1880: IV: p. 177 (Philippines, ? ex Singapore); Brandis, 1906: p. 524, Bor, 1963: p. 59 (Malay peninsula); Blume, 1825–1826: 2: p. 575, Backer *et al.*, 1936–1968: 1: p. 139 (Java); Roxburgh, 1820–1832: 3: p. 843, Lumsdain, 1821: pp. 3, 4, Voigt, 1845: p. 60, De Candolle (1886) 1964: p. 419 (Sumatra, Penang); Flückiger and Hanbury, 1879: p. 502 (Malacca, Singapore, Penang, Sumatra); Lecomte *et al.*, 1907–1938: V: p. 99 (Indochina); Mason (1850) 1882: 2: p. 289 (Mergui, Burma); Earl, 1850: p. 386 (Singapore); Dunn, 1975: p. 89 (Pahang).

40 Burkill, 1935: 2: pp. 1524, 1526–1527; Vlekke, 1945: p. 90.

41 Ovington (1696) 1929: p. 135. "Never planted" according to J.-B. Tavernier [1640–1667] (trans. V. Ball) 1889: 2: p. 15. The part played by pigeons is also reported from Madagascar (Rochon, 1792: pp. 340–351).

42 Brandis, 1906: p. 524 (Grenada and other West Indian islands); Voigt, 1845: p. 60, Bor, 1953: p. 59, Desmond, 1992: p. 204 (India); Ly-Tio-Fane, 1958, 1970 (Mauritius, Réunion); Flückiger and Hanbury, 1879: p. 502 (Bengal, Brazil, West Indies); De Candolle (1866) 1964: p. 419 (Bourbon, Mauritius, Madagascar, tropical America); Rochon, 1792: pp. 350–351 (wild nutmeg of northern Madagascar, taken to Isle de France [Mauritius] in 1768). On the species in Madagascar, see Lamarck, 1783-ca. 1788: IV: pp. 385–391. *M. fragrans* was brought to Kew in 1795 (Aiton, 1811: 5: pp. 419–420), for which Sir Joseph Banks was again responsible.

43 Li, 1979: pp. 81–82.

44 Flückiger and Hanbury, 1879: p. 502; Burkill, 1935: 2: p. 1527. In some areas ratios may be 1:3, or even lower.

45 Crawfurd, 1820: 1: p. 505; Burkill, 1935: 2: p. 1524 (half a dozen races).

46 Orta, 1913: p. 273. See also Barbosa [ca. 1518] 1921: p. 231.

47 Pires (1512–1515) 1944: 1: p. 207; Barbosa (ca. 1518) 1921: p. 197; Meilink-Roelofsz, 1962: p. 94.

48 In 1505, cloves in India sold for 7.5 ducats per cwt., nutmegs for 4 ducats; in Lisbon for 60–65 ducats and 300 ducats, respectively (Lach, 1965: 1: p. 110).

49 Forbes (1878–1883) 1885: p. 287 (with illustration).

50 Orta, 1913: p. 273. See also Huyghen van Linschoten (1596–1598) 1885: 2: p. 84; Fryke and Schewitzer (1700) 1929: p. 88 ("the whole fruit is very proper to preserve, and it is an excellent confite").
51 Slooten, 1959: p. 322.
52 Brandis, 1906: p. 553. As Da Orta ([1563] 1913: p. 395) put it, "the scent is in the centre."
53 Crawfurd, 1820: 1: p. 419.
54 Orta, 1913: p. 396.
55 Sprague and Summerhayes, 1927: map.
56 Pigafetta, 1969: pp. 140 (sketch map)–141.
57 Orta, 1913: pp. 393–394.
58 Ibid: p. 395 (earlier, he says that red sandal grows in Tenasserim, Burma). Cf. Matthioli Senensis (1555) 1559: p. 45, line 54; C. Acosta (1578) 1593: pp. 124–125. According to Huyghen van Linschoten [1596–1598] (1885: 2: p. 102), "the red sanders groweth most in the coast of *Choramandel* [south-eastern India] and *Tanassariin*."
59 Cosmas (ed. and trans. J.W. McCrindle) 1897: p. 366.
60 As a garden ornamental it is found today as far north as Saharanpur, 100 miles north of Delhi (Brandis, 1906: p. 554).
61 Henricum [van] Rheede Tot Draakenstein (ed. Johannes Casearius) 12 vols., 1678–1703.
62 Barbosa, 1918–1921: 2: p. 196.
63 Pires (1512–1515) 1944: 2: pp. 27, 272.
64 Orta (1563) 1913: p. 397.
65 Fedrici in R. Hakluyt (ed.) 1903–1905: V: p. 442.
66 Fitch in W. Foster (ed.) 1921: p. 46.
67 Huyghen van Linschoten, 1886: 2: p. 102.
68 Fischer, 1927: p. 200. Cf. Van Steenis, 1938: pp. 408–409 ("Most probably [sandalwood] is not native on the Asiatic continent, but has been imported thence from the Netherlands Indies.").
69 From documentary evidence, Gode ([1946] 1961: p. 321) found that white sandalwood, *śveta-candana*, "had become current in India long prior to A.D. 1100"; he catalogues (pp. 342–346) references to *candana* generally, from about the beginning of the Christian era to the nineteenth century.
70 Fischer (1927: p. 200) observed that "for many years, before the British conquered Mysore from Tippoo Sultan, the rulers of that country had exercised a royal prerogative over the sandal-wood tree and had imposed very stringent regulations against its exploitation without proper authority; in fact, the tree, wherever it occurred, and whether artificially or naturally grown, was the property of the rulers and not of the occupier of the land...."

71 Dunn, 1975: p. 87.
72 Fischer, 1938: p. 461 (and other substitutes and adulterants).
73 Orta, 1913: p. 399. Cf. C. Acosta (1578) 1585: p. 130 ("questo legno odorifero del Malabar...*sambarane*," and index "*sambaraac* legno specie di Sandalo").
74 Orta, 1913: p. 399.
75 Abū'l Fazl-i-'Allāmī (ed. and trans. H. Blochmann) 1873: p. 81.
76 Hirth and Rockhill (ed. and trans) in Chau Ju-kua, 1911: p. 209.
77 *Santalum album* has been planted and 'cultivated' since at least the nineteenth century in Indochina (Voigt, 1845: p. 303; Julien *et al.*, 1869: pp. 83–84; Maspero, 1928: p. 3 [*Campā*]); Burma (Kurz, 1877: 2: p. 329); central and southern China (F. P. Smith, 1871: p. 192; Stuart, 1911: p. 394 [Lingnan]; Laufer, 1919: p. 552; Read and Liu Ju-Ch'iang, 1927: p. 44 [Kwangtung]; Roi, 1955: p. 107 [Hupei and Szechwan]).
78 Burkill (1935: 2: pp. 1952–1953) states that more than 70 hosts have been identified.
79 Bor, 1953: p. 239 (most species of Anacartiaceae; also *Erythrina indica*, *Carica papaya*, and *Sapindus trifoliatus*, but not, surprisingly, *Strychnos nuxvomica* "although the bitter principle in the tissues of *Strychnos* is communicated to the sandal").
80 Chau Ju-kua (1178/ca. 1225) 1911: p. 208.
81 Pigafetta, 1963: p. 141.
82 Boxer, 1948: pp. 174–175, 180, 185. On the loss of Solor, Portuguese settlement shifted to Larantuka in the extreme east of Flores.
83 Chau Ju-kua, 1911: p. 208.
84 Hsü Yün-ts'iao, in F. S. Drake (ed.) 1967: p. 172. "White sandal oil" is included in a prescription (for "excessive heat of the head") in the Syriac *Book of Medicines* (ed. and trans. E. A.W. Budge, 1913: 2: p. 64), the date of which has been placed between the early Christian centuries and the early Islamic period.
85 Bullock and Harrison, 1958–1959: p. 52. On *Syzygium* spp. see Merrill and Perry, 1939: pp. 135–302.
86 Wit, in N.W. Simmonds (ed.) 1979: p. 216.
87 Micheli, 1729: p. 226 and tab. 108.
88 Linnaeus, 1753: pp. 470–471.
89 Ibid: p. 515; 1758–1759: 2: p. 1076 [594]; 1764: 1: p. 735 (hab. in *Moluccis*). Adopted by Miquel, 1855–1859: 1 (i): pp. 462–465.
90 K. Bauhin, 1623: pp. 410–411.
91 Plukenet, 1641: tab. CLV (figure 1).

92 Linnaeus, 1742: p. 524 [1016] (not in the first edition of *Gen. Pl.*, 1737), 1749: p. 179 [509].
93 Gronovius, 1755: p. 141.
94 Houttuyn, 1761–1785: 2(3): p. 337. Not in the first edition of Linnaeus *Species Plantarum*, 1753. In Warburg's scheme (1897: p. 378), the "*Series fragrans*" comprised three species, *M. fragrans* (Banda), *M. succedanea* (Halmahera), *M. schefferi* (New Guinea).
95 Carl von Linné [Linné the younger] 1781: p. 265; Linnaeus, 1784: p. 493 [1399]; Gaertner, 1788–1791: 1: p. 194.
96 Thunberg, 1782: p. 49, 1784: pp. 83–84, 1800: pp. 317–324 (an important *dissertatio*); Willdenow (Linnaeus *Sp. Pl.*) 1797–1824: IV(2): p. 869; Blume, 1825–1826: 2: p. 575.
97 Lamarck, 1783–1788: IV: p. 385, 1791: pp. 155–161.
98 Ruellius, 1536: p. 138. See also Matthiolus [on Dioscuridēs] 1544; p. 107; Cordus (d. 1544) 1599: pp. 19, 26, 46; Silvius, 1548: p. 67; Lobel, 1591: 2: p. 140; Clusius, 1605: pp. 13–14; K. Bauhin, 1623: pp. 407–408; Borel, 1666: pp. 259–260; Dale, 1693: p. 437; Plukenet, 1696: p. 265.
99 Turner (1538) 1965: p. 53; Gesner, 1541: p. 157.
100 Fallopius, 1565: p. 149.
101 J. Bauhin, 1650–1651: 1: pp. 264–266; Plukenet, 1641: tab. CCIX (figure l), 1696: p. 265.
102 Rumphius, 1750: 2: pp. 14–16.
103 Miquel, 1855–1859: 1 (2): pp. 53–55, also 1863–1869: 1: p. 205, 1870–1871: 1: p. 205.
104 Linnaeus *Species Plantarum* [1753] 1957–1959: 1: p. 349. *Santalum* is in the second edition (1742: p. 165 [383]), but not the first edition (1737) of *Generum Plantarum. Santalum album* in the *Flora cochinchinensis* (1790: 1: p. 87) of Joannes de Loureiro is not sandalwood but *Dysoxylum loureiri* (Merrill, 1935: p. 228).
105 *Sirium myrtifolium*, see Linnaeus (Sprengel) 1825–1828: 1: p. 489; Miquel, 1855–1859: 1 (i): p. 777; Usher, 1974: p. 523.
106 K. Bauhin, 1623: p. 392. His brother, J. Bauhin [1541-1613] *Hist. plant. univ.* (1650–1651, completed by others, 1 [i]: p. 486) has *S. album* and *S. citrinum*.
107 Rumphius, 1750: 2: pp. 42, 44.
108 Bontius, 1642: pp. 21–23.
109 Boxer, 1963: p. 28.
110 Ruellius, 1536: p. 134.
111 Gesner, 1541: p. 215.
112 Sylvius, 1548: p. 64.

113 Culpepper *Pharm. Lond.*, 1653: p. 12; Renodaeus *Dispensatory* (trans. R. Tomlinson) 1657: p. 287; Dale *Pharmacologia*, 1693: pp. 478, 512.

114 Wolters, 1967: pp. 39, 270 n. 37. Chinese synonyms in Roi, 1955: p. 236.

115 Hui-lin Li (trans.) 1979: pp. 87–90. The *Flora* is "reputed to be the oldest work on subtropical and tropical botany." The extant version apparently incorporates both earlier observations and later interpolations (Needham, 1986: p. 450). Hirth and Rockhill (ed. and trans. Chau Ju-kua, 1911: p. 210) noted the confusion in the *Flora* between the female clove and "the ripe and aromatic fruit of the *mi-hiang*, or eagle-wood [gharuwood] tree, of China." Wheatley (1959: pp. 68–69, map) shows gharuwood extending only as far north and east as Indochina and Hai-nan.

116 Laufer, 1918: p. 30 (5th–6th centuries).

117 Chau Ju-kua (1178/ca. 1225) 1911: p. 209.

118 Flückiger and Hanbury, 1879: p. 281 n. 3; Wolters, 1967: p. 270 n. 37. *Ting* in Giles, 1912: 2: p. 1395 [11253].

119 Schafer, 1963: p. 171.

120 I-Tsing (trans. J. Takatusi) 1896: p. 129.

121 On *mo-ting-hsiang*, see Hirth and Rockhill in Chau Ju-kua, 1911: p. 209[13] ("the large ones are called *ting-hiang-mu*"); Stuart, 1911: p. 95.

122 Hui-lin Li, 1979: p. 90 (figure 25, from the 1249 edition of a Sung [1098] *Pên-ts'ao* [materia medica], with illustrations based on an earlier work [1062] of the same kind.).

123 Read and Liu Ju-Ch'iang, 1927: p. 18 [225] ("habitat exotic").

124 Nieuhof (1682) 1732/1988: p. 164 (Malacca *synken*, Java *caampe* or *chanpe*); Hast in Thunberg, 1800: p. 326 (Javanese *chamka*, *chamke*); Watson, 1928: pp. 38, 40; Edwards and Blagden, 1930–1932: p. 725 (*chêh chieh*, transcription of Malay *chĕngkeh*, A.D. 1403–1511); Wilkinson, 1932: 1: p. 211; Gimlette and Thomson, 1939: p. 26; Echols and Shadily, 1975: p. 120; Barber [Balinese] 1979: p. 80.

125 Pigafetta, 1969: 1: pp. 122, 129.

126 Rumphius, 1750: 2: p. 3. Cf. Van Neck (1598) 1601a: appendix—Malay, *chanke*, 1601b: n. p., Malay, *syncke*, Javanese *syancke*.

127 *Gomode*, from Tidore, was the "only genuine native name" known to John Crawfurd, 1820: 1: p. 498. J. A. Robertson (ed. and trans. of Pigafetta, 1906: 2: p. 215) claimed, however, that *ghomode* = Sanskrit *gaumedi*, cow's marrow. *Gomode* also in Halmahera (Heyne, 1927: 2: p. 1183). According to Andaya (1993a: p. 50, 1993b: pp. 25–26), references to a "golden pestle and mortar" in Moluccan folklore possibly allude to the clove. The tale in question was first recorded by François Valentijn (d. 1727), who visited Ambon but not the northern Moluccas. Moreover, it is not clear that, be-

fore the arrival of Europeans, the Moluccas had the pestle and mortar of a kind that might have resembled the clove. Bellwood (1978: pp. 238–244, and figure 9.8) discusses evidence from New Guinea.

128 Pigafetta, 1969: 1: p. 174.

129 Orta (1563) 1913: p. 215. See also Olearius (1639), 1727: 2: p. 426 (*chamque*); Nieuhof (1682), 1732/1988: p. 164 (*caampe, chanpe*); Bickmore, 1868: p. 155 (*chenki*).

130 Heyne, 1927: 2: p. 1183.

131 Forrest, 1779: p. 420.

132 Hepburn *Dictionary,* 1867: p. 44 (cf. *kuge*, nail).

133 Laufer, 1916: p. 456 n; Hübotter, 1957: p. 60; Jäschke (1881) 1990: p. 620.

134 Laufer, 1916: p. 456 n; Laufer associates both the Tibetan and the Mongol words with Sanskrit *lavaṅga.*

135 Aymonier and Cabaton, 1906: p. 76.

136 Khory and Katrak, 1903: 1: pp. 64–65.

137 Nguyen-Van-Khon, 1958: p. 208.

138 Mayrhofer, 1956–1980: 3: p. 92 (Old Javanese *lawaṅ*); Zoetmulder, 1982: I: p. 994 (*lawanga*).

139 Rebello, in A. B. de Sá (ed.) 1954–1958: 3: p. 379.

140 Rumphius, 1750: 2: p. 3. See also Hast in Thunberg, 1800: p. 326; Clercq, 1890: p. 255.

141 Barker, 1979: p. 80. See also Ainsley, 1826: 1: p. 75.

142 Pigafetta, 1969: 1: p. 122. Cf. *bunga lowan,* Maguindano, Cotabato province, Mindanao (Forrest, 1779: p. 420).

143 Heyne, 1927: 2: p. 1183.

144 Kittel, 1894: IV: p. 1435; Watt, 1908: p. 527; *Tamil Lexicon,* 1924–1939: 1: p. 343; Gwyn, 1991: p. 461.

145 Watson, 1928: p. 74.

146 Wilkinson, 1932: p. 211; Gimlette and Thomson, 1939: p. 42.

147 Jordanus (ed. and trans. H. S. Yule) 1893: p. 28. Jordanus claimed that the region produced cloves "which, when they are in flower, emit an odour so pungent that they kill every man who cometh among them, unless he shut his mouth and nostrils." Cf. the observation of António Galvão (1544), *supra* p. 6. According to H. S. Yule (Jordanus: p. 28 n. 1), "there is an article in Indian commerce called 'cassia buds' bearing some resemblance to cloves and having the flavour of cinnamon."

148 Watson, 1928: p. 104 (and compound names of other species of *Myristica*).

149 Horne, 1974: p. 421; Echols and Shadily, 1975: p. 399.

150 Barker, 1979: pp. 60, 563.

151 Rigg, 1862: p. 335 (*tankal pala,* nutmeg tree).

152 Gonda, 1952: p. 206.
153 Monier-Williams, 1899: p. 716.
154 Gonda, 1952: p. 91. According to Gonda, Sanskrit *phala* has no Indo-European etymology, and the Tamil form belongs to a large group of Dravidian words.
155 Heyne, 1927: 1: p. 640. Forrest (1779: p. 446) reported Papuan *samkow*, nutmeg.
156 Orta, 1913: p. 275 ("in all the country where it grows").
157 Rumphius, 1750: 2: p. 16 (nom. vulg.).
158 Crawfurd, 1856: p. 304.
159 Rumphius, 1750: 2: p. 16; Crawfurd, 1820: 1: p. 506; Heyne, 1927: I: p. 640 (and *gosora* in northern Halmahera).
160 Pigafetta, 1969: 1: p. 174; Gonda, 1938: p. 116.
161 Forrest, 1779: p. 431 (*bunga palla*, Maguindano, Cotabato province, Mindanao). See also Van Neck [1598] 1601a: appendix—Malay *bonga pala*, mace.
162 Varthema (ed. G. P. Badger, trans. J. Winter Jones) 1863: p. 244, (ed. N. M. Penzer) 1928: p. 88.
163 Hsü Yün-ts'iao, 1967: p. 174.
164 Li, 1979: p. 82 (figure 22), and see *supra* p. 20. Cf. Giles, 1912: 1: p. 710 (5665); Read and Liu Ju-Ch'iang (*Pen Ts'ao Kang Mu*, A.D. 1596) 1927: p. 38 [461], 1931: p. 159 [503].
165 Bretschneider (1882–1895) 1937: 3: p. 120; Karlgren, 1923: p. 145 (nutmeg, cardamom—"all the dial. point to some Anc. form with *k'*-"); Li, 1979; pp. 38–39 (figure 5, A.D. 1062 [1249]); 82. Cf. Chao, 1953: pp. 398 [108], 405 [251].
166 Schafer, 1963: p. 185 (citing "the first Chinese to describe the nutmeg," an eighth-century pharmacologist).
167 Devéria, 1880: p. 98, Schafer, 1967: pp. 193–194 (Annam); Shaw, 1914: p. 86 (Kwangsi); Maspero, 1928: p. 133 (*Campā*, in tribute); Schafer, 1963: pp. 184–185 (Lingnan, Indochina, Tonkin), 1967: pp. 193–194 (Nam Viet).
168 Ferrand, 1913–1914: 1: p. 287.
169 Hsü Yün-ts'iao, 1967: p. 174. According to Monier-Williams (1899: pp. 241, 431), *kakkola* = "a species of plant, bearing a berry, the inner part of which is waxy and aromatic" and *takkola* = *Pimenta acris* (grown in Sri Lanka for its aromatic leaves—Usher, 1974: p. 459).
170 See Wheatley, 1961: pp. 184 (*Takkola* [the Land of] Cardamom), 224–228 (*Qāqullah*), 268–272 (*Takola, Takkola*).
171 Schafer, 1963: p. 185.
172 Laufer, 1916: p. 470 (91); Hübotter, 1957: p. 76 (*dsa-ti*).

173 Nadkarni, 1976: 1: p. 830 (and *zadi-phu-apoen*, mace).
174 Crawfurd, 1820: 1: p. 519; Ainsley, 1826: p. 376; *ai kamelin* (Timor) in Heyne, 1927: p. 589 (and possibly other local names under Ceram, Buru, Sumba). According to Burkill (1935: 2: p. 1953), *chandana* in Sundanese and east to Sulawesi, "but in most of the Malaysian area of the plant it has names which are not Sanskritic."
175 Watson, 1928: p. 234. Sometimes with *kayu* (tree, timber), *miniak* (oil) or *puteh* (white), *janggi* (red)—Gimlette and Burkill, 1930: p. 432; Burkill, 1935: 2: pp. 1828, 1832; Gimlette and Thomson, 1939: pp. 39, 41.
176 Gonda, 1952: p. 207 (Makassar also has *cinrana*, and Minangkabau *candano*); Echols and Shadily, 1975: p. 500; Zoetmulder, 1982: 1: p. 297.
177 Barker, 1979: p. 67. Gonda (1952: p. 207) has *candana*.
178 Schafer, 1963: p. 137.
179 Hirth and Rockhill (ed. and trans. of Chau Ju-kua) 1911: p. 209. See also Laufer, 1916: p. 470 [90] (*čan-t'an*); Edwards and Blagden, 1930–1932: p. 725 (*chên ta na*).
180 Giles, 1912: 2: p. 1324 [10706].
181 Chau Ju-kua (ca. 1225) 1911: p. 208; Read and Liu (trans.) [1596] 1927: p. 44 [540], 1931: p. 189 [590]; Unschuld, 1996: pp. 246, 360.
182 Hübotter, 1957: pp. 88, 95. Rosewood = **d'an* (Schafer, 1963: p. 137).
183 Klaproth (trans.) 1831: p. 159 (*zzan-dhan*); Laufer, 1916: p. 470 [90]; Läschke (1881) 1990: p. 655. *tsan-dan-dkar-po* = *Santalum album; tsan-dan-dmar-po* = *Pterocarpus santalinus* (Hübotter, 1957: pp. 88, 95).
184 Aymonier and Cabaton, 1906: p. 123; Gonda, 1952: p. 207.
185 Burkill, 1935: 2: p. 1952.
186 Kirtikar and Basu, 1918: 2: p. 119 (also *chandan nasaphiyn*). Brandis (1906: p. 553) gives *sandagu*.
187 Nguyen-Van-Khon, 1958: p. 1318.
188 Jirō Harada, 1950: p. 26 and pl. XXIV.
189 Polo (ed. and trans. H. Yule, rev. H. Cordier) 1903: 2: p. 272. *Necuveran* (Nicobar Islands), too, according to Polo, had "cloves" (ibid: p. 306, ? wild nutmegs) and, even more strangely, *Caindu* in western China or eastern Tibet (ibid: p. 56, ? cassia). Cf. Manoel Godenho de Eredia [1613] (trans. J. V. Mills) 1930a: pp. 60–61, 185, 1930c: pp. 256–261 (*Necuran*).
190 Odoric, in H. Yule and H. Cordier (ed. and trans.) 1913: p. 153. Cf. Jordanus (ca. 1321–1330, Malabar) 1893: pp. 30–31 (*Jaua*, cloves and nutmeg).
191 Abraham Cresques (ed. H. C. Freisleben) 1977: taf. 6. Cf. Bouchon and Tastu, 1841: p. 136; Ruge, 1881: p. 78.
192 G. Coedès (ed. and trans.) 1910: p. 60 (variously identified, ibid: p. 181).
193 Conti, in R. H. Major (ed.) and J. Winter Jones (trans.) 1857: p. 17.

194 Pires (1512–1515) 1944: 1: p. 207 ("Banda also has cloves which come in loads from the Moluccas to Amboina and from Amboina to Banda.") See also Castanheda (1528–1538) 1924–1933: III: p. 169 (liv. VI, cap. xi).

195 Hallberg, 1907: p. 449.

196 Murr, 1802: p. 146; Ravenstein, 1908: p. 88.

197 Galvão (1544) 1971: pp. 329–330.

198 Barros, 1777–1788: Dec. III(i): p. 567. *Seque* = Batjan, the largest and southernmost of the Moluccas.

199 T. Fischer, 1886: p. 182 (dated 1447, rather than 1457); Fischer and Stevenson, 1912: pp. 9, 12; Tooley *et al.*, 1969: p. 115. Fischer and Stevenson unjustifiably dismiss the identification *Bandam* = Banda on the grounds that "cloves do not come from that island."

200 Zurla, 1806: p. 49 [27]; Gasparrini Leporace [Mauro] 1956: pp. 27 [XIII. 13] *Bandam—garofali,* 33[XIX. 14] *Sondai—nose muscase.* The original is lost, "but a copy (1460) exists in Venice." On Mauro's map, see also Denucé, 1908: pp. 10–11, Bagrow and Skelton, 1964: p. 72.

201 Murr, 1802: pp. 139, 144; Ravenstein, 1908: pp. 87 (*gariofilli negel*), 89 (the 12-item legend of Bartolomeo Fiorentio, a person otherwise unknown, who claimed to have traveled in the East between 1400 and 1424). In doubting the authenticity of Bartolomeo's statement, it is not clear why Ravenstein thought it "incredible" that spices on their way to Venice should first pass through Java and then a succession of other countries, as far west as Aden and Cairo. See also Tiele, 1874: p. 227; Bagrow and Skelton, 1964: pp. 106–107. The globe, made in Nuremberg, cannot have been seen by Columbus.

202 Varthema, 1863: p. 245, 1928: p. 89. *Monoch*—where "we disembarked" [ca. 1505]—is not the first rendering of Moluccas by a European (*infra* p. 87).

203 Orta, 1913: p. 61. R. Carnac Temple (*Discourse*, p. xxii, see note 204, *infra*) claims that Orta used an "incorrect Spanish edition" of 1520, and refers to several misstatements by Orta.

204 See A. Cortesão in Pires, 1944: 1: pp. lxvii ("fanciful" on lands to the east of India), 213 (*Monoch*: "the famous Bolognese was never there"). On the other hand, Varthema also has been vigorously defended: R. Carnac Temple's *Discourse* in N. M. Penzer's edition of Varthema, 1928: pp. xvii–xxvi; Guehler, 1947: pp. 113–149. Lach (1965: 1: p. 165 n. 62) was "inclined to accept Varthema's account as credible."

205 Carnac Temple *op. cit.*, pp. xxiv–xxv.

206 On camphor, Varthema (1963: p. 248, 1928: p. 90) was at least circumspect, writing of *Bornei* (Borneo): "Every year a very great quantity of camphor is shipped, which they say [quite rightly] grows there, and which

is the gum of a tree. If it be so, I have not seen it, and therefore I do not affirm it." The gum of a tree (here *Dryobalanops aromatica*), or something more fanciful, was still often a description of camphor two centuries or more later.

207 Barros (1563) 1777–1788: Dec.III (i): pp. 585–587.

208 Ibid: pp. 592–597. See also Rebello (1561–1569) in A. B. de Sá (ed.) 1954–1958: 3: p. 406; C. O. Blagden (trans.) 'Letter of the King of Ternate to the King of Portugal, 1521,' 1930: p. 87.

209 Castanheda (1528–1538) 1924–1933: II: p. 210 (liv. III, cap. lxxxvi); López de Gómara (1551) (ed. P. Guibelalde) 1954: 1: p. 172; Rebello (1561–1569) in A. B. de Sá (ed.) 1954–1958: 3: p. 407; Barros (1563) 1777–1788: Dec. III (i): p. 599.

210 Documented by R. B. Smith, 1968: pp. 44–56 (1513/14–1521).

211 Cortesão, in Pires, 1944: 1: p. 215 n.1. From ca. 1526, some Portuguese vessels sailed from Malacca to the Moluccas by a route to the north of Borneo, through the Sulu Sea; then returning to Malacca by the long-established southern route, Flores Sea and Java Sea (Ptak, 1992: pp. 45, 47, and map 3).

212 López de Gómara (1551) 1954: 1: pp. 175–178. For this and earlier attempts to agree on a line of demarcation, notably in May 1493 (Bull of Pope Alexander VI), see S. E. Dawson, 1899: pp. 467–546, Bourne, 1901: pp. 193–217. Most of the documents are printed in E. H. Blair and J. A. Robertson (ed. and trans.) 1903–1909: I. The line is first shown on the *Cantino* map of 1502. The Treaty itself was confirmed by Pope Julius II on January 24, 1506.

213 Fernández de Navarrete (ed.) 1825–1837: IV: pp. 188–189; Maximillianus *De Moluccis Insulis* [October 1522] 1903: p. 310.

214 Denucé, 1908: pp. 37, 120–121, 135.

215 Hamy, 1891: pp. 125, 128, 132–133, 142; Denucé, 1908: pp. 37, 135. The reproduction in F. Kunstmann, K. von Spruner, and G. M. Thomas (eds.) *Atlas zür Entdeckungsgeschichte Amerikas, aus Handschriften der k. Hof. und Staats-Bibliothek, der k. Universitaet und des Haupt-conservatoriums der k. b. Armee* (München 1859) unfortunately does not show eastern Indonesia.

216 Cortesão, 1936: pp. 518–524.

217 Hamy, 1891: p. 128; Denucé, 1908: pp. 39, 122; Cortesão, 1935: pp. 272–278, 1936: p. 524.

218 Fernández de Navarrete (ed.) 1837: pp. xlix, 155 (letter from Sebastián Alvarez to the King of Portugal, July 18, 1519).

219 On the preparation of charts for Magellan's voyage, see Lach, 1965: 2: p. 601 and n. 569.

220 Cortesão, 1935: 1: pp. 340–345, 1939: pp. 152–153, 1944 (in Pires), 1: p. 213, 2: p. 530.

221 Cortesão, 1935: 1: pp. 270–272.

222 Denucé, 1908: p. 135.

223 Reproduced in R. A. Skelton's edition and translation of Pigafetta, 1969. According to Skelton (1: p. 13), the sketches "must be derived from originals executed during the voyage. Their simplicity of character points to the work of an unprofessional hand, most probably Pigafetta's." In any event, "the little charts are the only first-hand graphic materials to survive from the navigation." The route of the expedition between the Philippines and Timor (to which most of the sketches relate) is shown on a map in Denucé, 1911: pl. VI. The *Vittoria* left Tidore on December 21, 1521.

224 E. H. Blair and J. A. Robertson (ed. and trans.) 1903–1909: I: pp. 305–337.

225 A map drawn by Pedro or Jorgé Reinel, completed in 1524 and now in Istanbul, may have been commissioned for the Badajos conference (Destombes, 1939: p. 184; on whether the cartographer was Pedro or Jorgé Reinel, see Cortesão in Pires, 1944: 2: p. 530).

226 Bourne, 1901: p. 210.

227 López de Gómara (1551) 1954: 1: p. 180, 2: pp. 351–352; Fernández de Oviedo y Valdés (1535) 1959: 2: pp. 239, 284–285, 295.

228 Only in the mid-1560s was it discovered that it was necessary, on account of the prevailing winds and currents, to sail north to about 43 degrees before turning east, in due course the route of the Manila galleon bound for Acapulco. Andrès de Urdaneta left the Philippines on June 1, and arrived at Acapulco on October 30, 1565.

229 In 1637, Peter Mundy (ed. R. Carnac Temple and L. M. Anstey, 1907–1936: 3: p. 251) observed a Spanish galleon, loaded with nine or ten tonnes of cloves as well as dyewood and Manila tobacco, anchored near the mouth of the Canton River.

230 Magnaghi, 1929: pp. 82–83; Cortesão, in Pires, 1944: 1: p. 213, 2: p. 530. The terrestrial globe (1524) of Johannes Schöner (F. C. Wiedner, 1925: 1: pl. 2, third gore from the left) has only *Moluce Insule*, off the coast of *Gelolo*.

231 Cortesão, 1935: 2: pp. 145–151.

232 Cortesão, 1939b: pp. 152–153.

CHAPTER 2

India

Age and Area

Indian literary sources—ancient and medieval—are notoriously difficult to use for either historical or geographical purposes. The study of historical geography is therefore at a double disadvantage: almost nothing is securely dated or precisely located. Authors appear to have little or no sense of time or place.

Some of the oldest texts are evidently based on oral traditions of indeterminable age and territorial provenance. Most of the surviving texts of medieval or earlier date are compilations or joint productions, involving a number of authors, not necessarily contemporaries. Most, too, have been edited or revised on several occasions, when new material appears to have been added and old material omitted or lost. The major Indian languages, whether Āryan or Dravidian, have extensive vocabularies, with numerous synonyms. Furthermore, some words refer to two or more different, if related, objects, such as species or varieties of plants, and other words have both a symbolic and a literal meaning, all leading to kinds of ambiguity that are comparatively rare in Western literature.

Indian sources, for our purpose, belong to three main categories: (i) those in which none of the Moluccan products is mentioned, (ii) in which only sandalwood is mentioned, and (iii) in which cloves and/or nutmeg are (also) mentioned. These categories are not (for some of the reasons given above) always discreet or in strict chronological sequence, although there does seem to be some semblance of chronological order. Nothing relevant has been found in

the oldest, Vedic (Āryan) literature, commencing with the *Ṛgveda* and including the *Sāmaveda* and the *Atharvaveda Saṃhitā*, all of which belong to northern India, possibly originally to Central Asia.

A number of important Indian sources that were composed before the middle of the first millennium A.D. mention only sandalwood. Cloves and nutmeg were certainly known then (as other sources prove) but were apparently far less common. At what date seeds or seedlings of *Santalum album* were first introduced and India ceased wholly to depend on imports we do not know, but probably before A.D. 500. A few early sources hint at supplies brought from South East Asia.

Sandalwood (*candana*) appears in Yāska's *Nirukta*, a commentary "no later than 500 B.C." on the Vedic vocabulary *Nighaṇṭu*.[1] In Kauṭīliya's *Arthaśāstra* (ca. third century B.C.), a manual of administration of the Maurya dynasty, there is an inventory of "precious articles received into the Treasury." These include many "fragrant substances."[2] The "excellences of sandalwood" are described as:

> Light, smooth, not dry, unctuous with oil like butter, pleasant in smell, penetrating the skin, unobstrusive, not losing colour, capable of bearing heat, allaying heat, and pleasant to the touch.

Fifteen or sixteen putative varieties (based on color and aroma) are associated with localities in India. The nomenclature alone suggests long familiarity. Separately, we are told that "*kāleyaka* from *Suvarṇabhūmi* is smooth and yellow." *Kāleyaka* is yet another kind of sandalwood (*S. flavum*),[3] and *Suvarṇabhūmi* one of the earliest of many references in the Indian literature to South East Asia. Kauṭīliya also mentions *jātī*-flower, here probably jasmine rather than nutmeg.

Fragments of the *Jātaka* ('Stories of the Buddha's Former Births') belong to the time of Gautama Buddha, the major portion to later periods, and some to as late as the early centuries A.D. We read of sandalwood powder sprinkled on a king—a form of consecration—and of a fine sandalwood bowl.[4] Yellow sandalwood was easy to carve, of attractive appearance, and pleasantly scented when fresh. The first known Chinese Buddhist pilgrim to India, Fa-hsien (399–414) remarked on the use of 'incense' in religious ceremonies and on a carving of Buddha in sandalwood at *Sāwathi* (Śrāvastī) in northeastern India[5] (Map 2). A comb of sandalwood, probably belonging to the eighth century and imported from India, was found at Kara Dong in Chinese Turkestān (Khotan).[6] The carving of sandalwood became the speciality of the *Gudigar* guild of northwestern Mysore.


Approximate present boundary between Āryan (N.) and Dravidian (S.) languages
Ports in Ptolemy (2nd century AD) and/or the *Periplus* (ca. AD 100) and possible places of embarcation for South East Asia
Other places mentioned in the text
Indus
Brahmaputra
Mathura
Śrāvastī
Ganges
Sarnath
Nālanda
BARUGAZA
Tamluk
SOPARA
Puri
KALINGA
KHRŪSE
Amaravati
MASALIA
PALLAVAS
CHOLAS
SŌPATMA
PODUKĒ
KAMARA
MUZIRIS
(CRANGANORE)
MALAYA
Madurai
PALAISIMOUNDOU
(SRI LANKA)

MAP 2. India.

The *Śilappadikāram*, one of five major Tamil epics, is thought to date from about the second century A.D. There is much on 'fragrances' and many references to sandalwood, including "sandalwood paste of the southern seas," apparently imported.[7] The two great Sanskrit epics, the *Mahābhārata* and the *Rāmāyaṇa*, which attained their present form in the third or fourth century, frequently mention sandalwood,[8] and the latter work possibly cloves on at least one occasion.[9] In the *Rāmāyaṇa*, sandalwood is burnt for the aroma and, as a paste, used to anoint the brow. It became the most popular of aromatics, presumably following the introduction of the species to southern India.

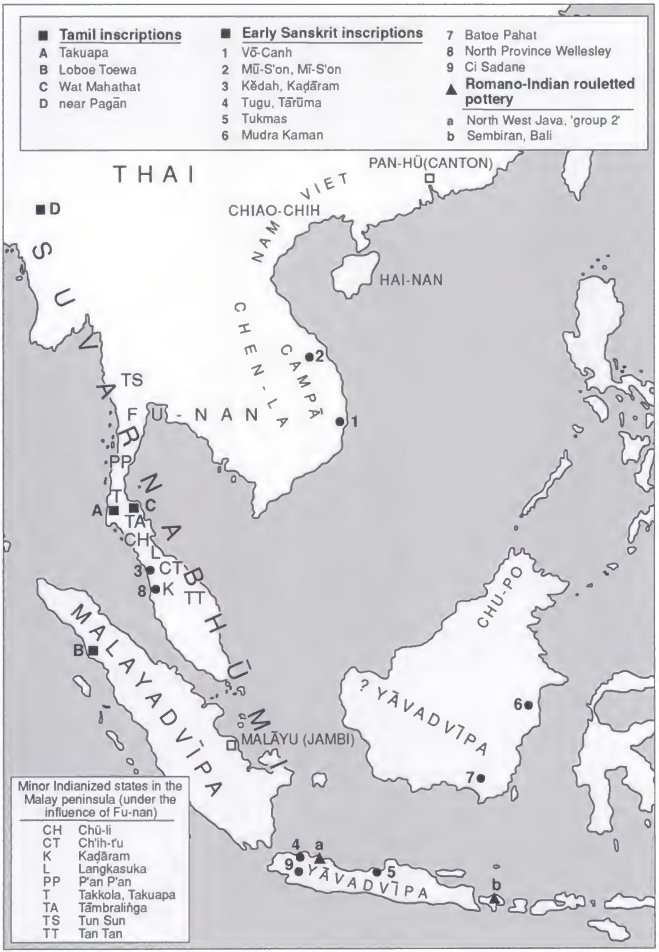
At least two of the *Purāṇas* refer to sandalwood, the *Matsaya Purāṇam*, believed to be one of the oldest (ca. A.D. 200, but origins much earlier),[10] and the *Vāyu Purāṇa* (up to the fifth century A.D.) where *"Malaya dvīpa* has mines of precious stones and gold, besides sandalwood and ocean mines (? pearls)."[11] *Dvīpa* was an 'island,' 'peninsula,' or 'region,' here in the transplanted Malaya (or Malaysian archipelago) of South East Asia—probably Sumatra (Map 3).

Further religious associations are exemplified in other early texts. In the *Milinda-Pañho* ("Questions of Milinda" [Menander], a Bactrian king fl. 150 B.C.), the sage Nāgasena describes sandalwood as one of the "desirable things of the earth," and then "there fell from heaven a shower of sweet scented sandal dust,"[12] taken to be a mark of approval by the gods. A "gift of yellow sandalwood" is used to consecrate a king in the *Mahāvaṃsa*, the Great Chronicle of Sri Lanka.[13] In the *Kathākoṣa*, a treasury of Jain stories ("of considerable antiquity") a funeral pyre (*chita*) is made of sandalwood, a custom still practiced today.

There are countless references to combinations of cloves, nutmegs, and sandalwood in a great variety of Indian sources. Here we are only concerned with those that belong, roughly, to the first half of the first millennium. They show that cloves and nutmegs, like sandalwood, were known from a very early period, doubtless from about the time of the first Indian contacts with mainland South East Asia and western and central Indonesia, to which Moluccan products were traded by at least the beginning of the Christian era.

The principal relevant texts are comprehensive medical treatises in which mace and cloves are named, albeit infrequently, in compound remedies. The impression is that these "drugs" were then rare, recently obtained, and relatively unimportant, although probably costly.

The older of two famous Sanskrit medical works, compiled no later than the first century A.D. (and possibly several centuries earlier) is the *Caraka Saṃhitā*, a thesis on *āyurveda* (*veda*, knowledge of, or for the sake of, *ayus*, longevity) written by Agniveśa, revised by Caraka, and edited in the ninth century by Dṛḍhabala.[14] Here it is recommended, apparently for the first time,



MAP 3. Indianized South East Asia.

that nutmeg (*jātiphala*) and cloves (*lavaṅga*), as well as betel flavored with camphor, should be "kept in the mouth...to promote fragrance of breath."[15] Cloves, nutmeg, and sandalwood also were used in one of several "unctious preparations."[16] The second treatise, the *Suśruta Saṃhitā* appears to be several centuries later than, and in part based on, *Caraka*. The former names about 750 medicinal substances, the latter 500. Cloves, nutmeg, and camphor (with or without betel) are again recommended "to remove bad odours from the mouth and cleanse it of all impurities."[17]

The oldest extant Sanskrit manuscript on medicine, from the second half of the fourth century, was found in a Buddhist monument at Kushā in Chinese Turkestān. It contains many references to sandalwood, none to cloves or camphor. There is, however, one to nutmeg, if *phalam* is taken (as by the editor) to be *jātiphala*[18] rather than *phalgu* (*Ficus oppositifolia* [*hispada*]),[19] which appears in another and rather similar prescription.

The *Purāṇa* probably had taken shape by the close of the Vedic age, but it continued to develop up to about the beginning of the Gupta period (ca. A.D. 320). Parts of two sister works, the *Garuḍa Purāṇam* and the *Agni Purāṇam*, are concerned with medical matters and under nutmeg and cloves (*lavaṅgaphalam*) convey roughly the same information. They were used to fumigate rooms, to remove the odor of perspiration and bad breath, and,according to the *Agni Purāṇam*, to prepare an oil "used by kings before bathing."[20]

Among Sanskrit works unconnected with medicine, the metrical dictionary *Amarakośa* of ca. 450 A.D. refers to all the Moluccan products[21] and was of sufficient general interest to be translated into Chinese as early as the sixth century.

Evidence of a different kind, with probably the first securely dated reference to *lavaṅga*, comes from Kālidāsa, ancient India's greatest dramatist and lyric poet, who lived in the early fifth century. In the *Raghuvaṁśa* ("The Story of Raghu's Line"), the seductive aroma of sandalwood is mentioned several times,[22] the "clove's rich scent...from distant isles [*Dvīpāntara*—the East Indian archipelago]" once.[23] This is echoed in Rājaśekhara's *Kāvya-Mīmāmsā* (ca. 900): "les vents qui amènent des continents lointains [l'odeur] des fleurs de girofle."[24] In the *Kumārasambhāva* ('The Origin of the Young God'), Kālidāsa calls to mind "the south wind [the *Malayamarut* that blows during the hot season],[25] smelling of sandalwood branches and the filaments of *lavaṅga* blossoms."[26] The assumption must be that cloves were sufficiently well known to his audience or readers. By A.D. 500 sandalwood was presumably obtainable from Indian forests; clove and nutmeg (the latter not in Kālidāsa), on the other hand, were exotics, mentioned and used sparingly. In Bāṇabhaṭṭā's *Harṣa-Carita*, dating from the seventh century, "clove flower bunches and nutmeg clusters, all bristling with masses of ripe fruits" are specified among evidently precious presents to the king.[27]

Clove

From at least the time of Kālidāsa it was known in India that cloves grew in the Eastern archipelago (*Dvīpāntara*). But Kālidāsa also implies, in the passage just quoted, that *lavaṅga* had been introduced to southern India, the south wind wafting the scent from Mount Malaya (Malabar). The same allusion is found in an anthology of Sanskrit court poetry, Vidyākara's *Subhāṣitaratnakosa*, dating from the eighth to the eleventh centuries. The spring breeze, known as the 'scent bearer' (*Gandhavāha*), came up from the south "fluttering the groves of *lodhra* (*Symplocos racemosa*), clove and parrot-plum."[28] Parrot-plum is a translation of *lavalī*, a vine (*Averrhoa acida* [*Phyllanthus cicca*]), native to southern India and associated symbiotically with *lavaṅga* by the dramatist Bhavabhuti (seventh–eighth centuries).[29] Clove trees in a "fragrant garden" belonging to the legendary Nararvāhanadatta, son of the King of Vatsa (middle Ganges), are mentioned in Somadeva's *Kathāsaritsāgara*,[30] compiled toward the end of the eleventh century. A Chinese description of *Yin-du* (Hindustan) in 1259 includes cloves (*ki- she-hiang*) among the country's "famous medicines."[31]

Unless species or scents have been conflated or confused (? *lavaṅga* as cinnamon), we are obliged to infer that cloves were grown in southern India by the middle of the millennium, probably as sweet-smelling garden ornamentals. They are grown today but, unlike local sandalwood, have never been of much commercial importance,[32] partly because of the availability of supplies shipped west from Indonesia by way of India from at least the period of Arab mercantile activity.

Nutmeg

At the beginning of the seventeenth century, *Myristica fragrans* was grown "out of curiosity" in and around Goa.[33] It was said to be "successfully cultivated in Madras and southern India" in the late nineteenth century,[34] but more recently reported as "found only as a specimen tree in a few localities [in India], chiefly botanical gardens."[35] No ancient or medieval Indian source supports any significant introduction.[36]

The Chinese chronicler Ma Tuan-lin (ca. 1300) believed that *Chu-lien* (Coromandel) "produced nutmeg,"[37] but he, or rather his informants (for he never visited India) probably only meant that nutmegs were known or available there, or perhaps they were somehow misled by the presence of wild nutmegs. There are several species of *Myristica* in warm, moist parts of southern India (Canara, Malabar, Travancore),[38] notably *M. malabarica*;[39] this has little fragrance or aromatic taste, but has long been used to adulterate East Indian nutmeg and mace.

Sandalwood

Sandalwood's original connection with South East Asia is apparent in Kauṭiliya's *Suvarṇabhūmi* and other reports of *Malaya Dvīpa* and the 'Southern Seas' (*supra* pp. 48–50). The *Rāmāyaṇa* names *Ṛṣabha* mountain, identified by Sylvain Lévi as lying in either Timor or Sulawesi.[40] This would indicate astonishingly accurate information (whenever the passage was included in the *Rāmāyaṇa*), for Timor was the source of the most abundant and finest sandalwood in historical times.

Attention has already been drawn to Kauṭiliya's list of fifteen or sixteen localities where sandalwood was reputedly obtained in India,[41] chiefly in the South West (*Malaya*), but also surprisingly in *Kāmarūpa* (Kamrup), Assam.[42] The Indian forester C. E. C. Fischer observed that sandalwood has never been known in Assam. This and the strange colors and aromas of some regional varieties in Kauṭiliya's list lead one to suppose that by no means all the names refer to *Santalum album*.

Sandalwood is closely associated with *Malaya* by Kālidāsa (ca. 450), the Chinese traveller Hsüan Tsang (mid-seventh century), and Rājaśekhara (ca. 900).[43–45] 'Malaya mountain' in the southern Western Ghats or the Nilgiri Hills is called *Çandanagiri* on account of the *candana* forests.[46] *Malayajam* and *malayodbhava* were two of the many names for white sandalwood.[47] Vidyākara (eighth–eleventh centuries) perfumed the south wind from Mount Malabar with sandalwood as well as cloves.[48]

The Emperor Jahangir (1624) in his *Memoirs* commented that "the sandal-tree, which once was peculiar to the islands, also flourishes in the gardens."[49] If, as the translators assume, 'islands' refers to the East Indies, it is remarkable that the memory of their monopoly survived in northern India into the seventeenth century. A few decades earlier (ca. 1590), Abu'l Fazl-i-'Allāmī remarked that "during the present reign (of Akbar), [sandalwood] has been successfully planted in India."[50] Again perhaps we should understand "northern India," whether the tree was then introduced or its distribution merely extended.

NOMENCLATURE

Clove

The word for "clove" in virtually all the Indo-Āryan languages of northern and central India is derived from later Sanskrit and Pāli *lavaṅga*.[51] This is also found as a loan-word in some of the Dravidian languages of southern India, notably Telugu *lawanga* [*-pu*],[52] and Kanarese and Kannaḍa *lavaṅga*.[53] The

usual Tamil word is *kirāmpu* (*pu* = flower), but there also is a Sanskrit-related synonym *ilavaṅkam*.[54] Malayalam has *karámpu*, Telugu *karavappu* (in addition to *lawanga*), and Dravidian usage survives or survived in Singhalese *karambu* or *karábu* and, beyond the Bay of Bengal, in Khmer *klaṃpū*, *kraṃpū*, and Cham *kō' rbu*.[55] Sanskrit vocabularies spread south in company with Āryan influence generally, displacing or supplementing a Dravidian nomenclature that also had a connection, possibly earlier, with 'cinnamon.'

Arabic *karanful* and Greek *karyophyllon* are probably descended from either a Dravidian root or some composite Sanskrit word, at any rate an Indian source. *Lavaṅga* also appears to be a loan-word—from Malay *lawang*, Old Javanese *lawaṅ*.[56] Where, in Indonesia and the Philippines, cognate forms exist,[57] this can be explained either by the introduction of Sanskrit in the process of Indianization, or by the expansion of Malay as a *lingua franca* before ca. 1500. Antonio Pigafetta's (1522) *bonghalanan* from Saranghani Island in the Philippines[58] is *bunga* (flower) *lawang*. The more common name in Malaya and Java today, *chengkeh* (with variants) is of Chinese origin. Here, as in other aspects of Indonesian life, Indian and Chinese influences have long been in competition.

Nutmeg

Names for nutmeg and mace in the Indo-Āryan languages all appear to be derived from Sanskrit *jāti-phala* (fruit), *-patri*, *-pattri*, *-pattrikā* (arillus), *-kōṣa* (sheath). *Dza-ti* (nutmeg) in Tibetan is clearly a loan-word.[59]

The Dravidian languages combine *jāti* (*jādi*, *jāji*) with *-kāy* (pod, nut, unripe fruit),[60] or, influenced by Sanskrit, with *-pattiri*, *-patri*, *-phal*. In Singhalese, *sádikká*,[61] a Dravidian survival, parallels *karámbu* (clove). Sanskrit *jai*, *jati*, synonym *mālatī*, have a variety of meanings.[62] One is jasmine (*Jasminum grandiflorum*), which probably dates from a time before Moluccan nutmegs were known. *Mālatī-phala* is a nutmeg.[63] Exotic species are often associated by name with what is already familiar, a source of later confusion.

Sandalwood

Sanskrit *candana* has a Dravidian root:

> Tamil *cāntu*, pigment, paste, sandal paste; sandal tree, *cāntam* sandal, *cāttu* to daub, smear, anoint, Malayalam *cāntu* a kind of ointment or paste of sandal, Kannaḍa *sādu* a fragrant substance, perfume....Here the Dravidian word for sandal is quite clearly seen to be native since it is etymologically connected

with other words meaning 'to rub into a paste,' and the specific meaning 'sandal' has developed out of a more general meaning.[64]

Santalum album is believed to have been introduced to southern India from South East Asia (*supra* pp. 48–50). The Indian name, in its borrowed Sanskrit form, was later carried to (a) non-Āryan and non-Dravidian linguistic groups in northeastern India (Mundā *chandan*,[65] Santal *candan, condon*[66]), (b) Tibet (*tsan dan*),[67] and (c) South East Asia, where variants are widely distributed today, from the mainland (Cham *čandal*)[68] through the archipelago (*candana, candano, cēndano, cenana, ceṇḍana, cinrana*),[69] modifying or eliminating the native nomenclature.

Candan(a) is often prefixed by a word for color: *śvetá-* white, *hema-* golden, *hari-* or *pīta-* yellow, *srī-* 'light colored', and *rakta-* red (*Pterocarpus santalinus* or *P. indicus*). In Brahman tradition, *haricandana* was one of the "five trees of paradise"[70] and the name of a god (? Agastya) in Java.[71] *Harišyama* and *gośīrṣa* were two 'kinds' of yellow sandalwood.[72] Other Sanskrit names include *malayaja, gandhasāra, sitahima, paṭīra, kāleyaka.*[73] Generally, the richer the vocabulary, the earlier and more important the use.

USE OF MOLUCCAN SPICES

Aromata

Aromatic products were used in greater quantity and variety in ancient and medieval India than anywhere else in the world. Evidence of this might be found in almost any kind of document, for the pattern of use embraced every aspect of life, secular and religious, from birth to death, at all social levels. Naturally, however, the connoisseurs of perfume, accompanied by ostentatious consumption, belonged to the numerically small upper classes, above all to members of the princely courts and to the great temples and monasteries. Here new and initially costly substances from abroad would be sampled and appraised and, in due course, incorporated in elaborate prescriptions. In the middle of the seventeenth century, Malabar alone "consume[d]...an abundance of cloves, nutmegs, mace" and other spices.[74] Compounds were preferred to simples. They were prescribed as perfumes, cosmetics, and materia medica, in powders, solutions, syrups, pastes, 'vapours,' oils and pastilles, each requiring expert preparation and therefore experienced perfumers and apothecaries. Perfumes generally were known as *gandhá,* sold by *gandhika,* perfumers' shops as *gandhikapana.* Vārahamihira's *Bṛhatsaṃhitā* (ca. 550) has a long section on the "Preparing of Perfumes."[75] Nutmeg, along with camphor and musk, was used

to revive the fragrance of other scents. A thousand years later, we are told that the Emperor Akbar was "very fond of perfumes and encourage[d] this department from religious motives."[76] The great mass of the population, in India as elsewhere, must have used what came readily to hand or could be cheaply bought and then prepared at home following traditional recipes.

For aromatics generally there were in India three kinds of demand: personal, medicinal, and ritual, all ancient and the first two closely related. Sandalwood was widely employed as a foundation perfume,[77] cloves and nutmeg, more specialized products, were chiefly used in the fields of medicine and personal hygiene.

Only the heartwood (*sāra*) of sandalwood, about one-third of the tree by weight, is strongly aromatic. Billets or fragments were burnt to fumigate rooms and clothes, indeed whole houses and their occupants.[78] Ground up or powdered (*cuṇṇa*) and combined with other aromatics, then fixed with some adhesive gum, it was made into 'incense sticks.'[79] The distilled oil "impregnated with the odour of spices," including cloves and nutmeg, was known as *mujmua*.[80] Upper-class families lived in an atmosphere heavy with perfume. In Tibet at the close of the eighteenth century, "cloves [were] the principal ingredient in the composition of the perfumed rods which men of rank [kept] constantly burning in their presence."[81]

Powdered, sandalwood alone[82] or, more commonly, in a paste was applied to the face and body as a cooling agent.[83] The word *candana* is sometimes used in the sense of 'refreshing.' Camphor 'dust' was the other traditional remedy for prickly heat[84] and was also thought to enhance the fragrance of sandalwood.[85] Both were associated with the seemingly frigid moon.[86] Their use as cosmetics spread with Indian immigration to South East Asia.[87]

The coolness as well as the fragrance of camphor and sandalwood was one explanation of why, from at least the time of Kālidāsa, they reputedly attracted hooded snakes or serpents (*nagas*), that coiled around the respective tree trunks.[88] The Buddhist pilgrim Hsüan Tsang, writing of the *Malaya* region in the seventh century, refers to sandalwood and *chandaneva*, a "tree like sandalwood," attracting "great serpents," and then goes on to discuss camphor (*karpūra*),[89] although the species from which it was then obtained were not found in India. The serpents, whether real or imaginary, served as guardians of what was clearly a valuable resource. From Tibet, we hear of "snake's heart sandalwood,"[90] used in medicine and a concept clearly of Indian origin. In the late eighteenth century, sandalwood was imported from Bengal and Bhutan.[91]

Perfumes were most commonly used to remove or mask body odors.[92] The *Agni Purāṇam* recommended that kings should apply an oil scented with *phala* (nutmeg), camphor, and other aromatics before bathing.[93] More customary

were applications after bathing,[94] and the water itself was often scented. Cloves and nutmeg cleansed the mouth, sweetened the breath, and were ingredients in toothpowder.[95] With areca nuts (*Areca catechu*), they were described by Somadeva as the "three fragrant fruits" (one of several *triphalā*),[96] added to betel leaves (*Piper betle*) and chewed.[97] Camphor sometimes took the place of the fruits.[98] The practice, reported in the *Caraka Saṃhitā*, the *Suśruta Saṃhitā*, and by I-Tsing[99–101] from Malaysia in the seventh century, was reputed to aid the digestion and, at the same time, banish halitosis.

Virtually all Hindu, Buddhist, and Jainian ritual was accompanied by the use of incense—aromatic substances generally rather than simply frankincense. This and interest in sweet-scented flowers were observed by Fa-hsien (ca. 410).[102] The later pilgrim Hsüan Tsang (629–645) wrote of powdered sandalwood sprinkled over the *bodhisattva* Tathagata.[103] The paste was widely used to anoint and mark the brow (*tilaka*),[104] the vapor to create an ambience for solemn acts of consecration and sacrifice. Funeral pyres of the wealthy were made of sandalwood.[105] Huge amounts were consumed at major festivals.[106] Pārsīs regularly burnt sandalwood in their fire temples.

Different aromatic substances belonged to particular gods.[107] Garlands of *jātiphala* and *lavaṇga* were worn on auspicious occasions.[108] Temples and monasteries welcomed gifts of sandalwood, cloves, and nutmegs[109] and often held large stocks. A Sanskrit inscription (1186) at the Khmer temple of Tà Prohm mentions musk, camphor, cardamoms, and a considerable quantity of sandalwood.[110] Gifts were also made to individual priests, exchanged between kings and princes, and taken as tribute.[111–113] In the words of Somadeva, sandalwood was "one of the jewels of an emperor."[114]

Materia Medica

Many of the specifically medicinal applications of sandalwood, as powder, oil or paste, were extensions of its putative cooling and astringent properties—to depress fever and quench thirst (notably in cases of cholera) and reduce inflammation. Sandalwood also was regarded as a remedy for headaches, skin disorders, muscular tension, and rheumatic and arthritic conditions, in fact for aches and pains generally. Most importantly, perhaps, the strong aroma, with its sacred associations, was of psychological benefit, lifting the spirit and inducing a feeling of well-being.[115] Not to respond to an "unguent of sandal poured all over the body"[116] was a measure of the seriousness of an illness—in this case love-melancholy.

Infusions of clove and nutmeg had similar virtues, being to some extent thirst-quenching and cooling. However, they were chiefly valued, as already

remarked, for purposes of oral hygiene and, as carminatives, for all dyspeptic complaints.[117] Additionally, nutmegs and mace were taken in tonics and cardiacs, oil of cloves for toothache. They were probably of relatively little importance solely as condiments.[118] In early modern times, spices generally were used in cookery more by Muslims than Hindus.[119] In ancient and medieval Indian texts, little distinction is made between dietary recommendations and medicinal prescriptions.

FARTHER INDIA: *India extra Gangem*

The growth of Indian influence in the mainland and archipelagos of South East Asia, from some time before the beginning of the Christian era, was the final, maritime phase of a process that started in the second millennium B.C. with the Āryan invasions of northwest India. Territorial advance was to the south and east. How much movement of population was involved after the initial invasions, which may have led to the collapse of the Indus civilization, is unknown, but probably little by comparison with the size of the indigenous population. The changes were cultural and ethnic rather than demographic, the essential components being linguistic and religious. The scale and consequences of such diffusion, from the Himalayan passes to central Indonesia were such as to invite comparison with the southern encroachment of the Han (also around the beginning of the Christian era), the post-Roman 'barbarian' invasions of western and southern Europe, and the emergence and expansion of Islam.

The Indian advance into South East Asia may have started much earlier than the opening of the Christian era, the period that is usually proposed. By the third or fourth century A.D. (the date of the first surviving Sanskritic inscriptions) colonization in whatever form had established a cultural and commercial bridge between India and South East Asia, first the mainland and then the archipelago at least as far as central Java and eastern Borneo. Demand for the products of South East Asia, in India and the West, was transmitted along this bridge, making contact with Indonesian intermediaries and suppliers, based near or a little beyond the limits of Indian penetration. In due course, the same intermediaries also served the Arab and Chinese markets.

Indian immigration and the introduction of Brahmanism and Buddhism increased the demand for aromatics in South East Asia itself. India, however, was the prime market. The poles of supply and demand lay, respectively, in eastern Indonesia and the classical and medieval West. Supplies to the West before Arabo-Persian commercial expansion in the seventh and eighth centuries depended upon Indian connections with South East Asia. There is no reason to

suppose that any significant quantity of South East Asian products reached the West through China and Central Asia either before or after the seventh century.

Language

The aforementioned cultural and linguistic changes involved the planting and diversification of Indo-Āryan languages in northern and central India (*Āryāvarta*) and, subsequently, the penetration and modification of indigenous vernaculars in southern India and South East Asia. The processes of displacement and borrowing of words and syntax in lands to the west and to the east of the Bay of Bengal—albeit one thousand miles or more apart—were essentially the same and, indeed, not separated by any great length of time. As pointed out by Georges Coedès, the peoples of South East Asia "had traits in common with the civilization of pre-Āryan India" and "the most ancient Sanskrit inscriptions of Farther India are not much later than the first Sanskrit inscriptions of India itself."[120] Speakers of Dravidian languages borrowed from Sanskrit or languages derived from Sanskrit, but there also was some borrowing in the reverse direction, by Indo-Āryans in the south of India and in South East Asia. Sanskrit was the literary language of an educated élite, Pāli (canon) a version used in the holy books of the Hīnayāna Buddhists. The modern, regional Indo-Āryan languages developed from Prākṛt, an early 'unrefined' (*prakṛta*) form of Sanskrit, around the close of the first millennium A.D. Immigrants to South East Asia would have spoken one or other of the Indian vernaculars, whether Indo-Āryan or Dravidian. The distribution of names for 'pearl' in South East Asia (*mutya, mutiara,* from *muttu*) clearly illustrates the direction and extent of Indian penetration.[121]

Legend

Another convincing illustration of Indian influence in South East Asia is the widespread presence of Indian legend and mythology. Both great Indian epic poems, the *Mahābhārata*[122] and the *Rāmāyaṇa*[123] were known at a very early date. Stories of the exploits of Rāma are also found independently of the *Rāmāyaṇa.*[124] The latter is traditionally ascribed to Vālmīki, but its present form is probably no older than the second or third century B.C.—about the time of the compilation of Kauṭīliya's *Arthaśāstra.* One or other has the first reference to *Suvarṇadvīpa,*[125] the parent toponym for South East Asia. In the *Rāmāyaṇa,* sandalwood is said to come from *Ṛṣabha,* thought to lie in either Timor or Sulawesi (*supra* p. 54).

There are versions of the *Rāmāyaṇa* in Malaya, Thailand, Cambodia, Java, and Bali, expressed in poetry, prose, and drama.[126] In Indonesia, episodes are

portrayed in stone reliefs.[127] It has been suggested that both Vālmīki and the authors or editors of the regional *Rāmāyaṇas* may have drawn on an even older source, common to much of South Asia.[128] Parts of the story reached the Philippines, which otherwise showed little Indian influence.

Toponyms

The individual sea merchant's knowledge of South East Asia must have been very localized: stretches of coastline, profiles of islands, headlands and distant mountain ranges, and, most important, many anchorages and small harbors, visited repeatedly and consequently well known. On the other hand, he could have had little by way of an overall picture, nothing remotely corresponding to a map of this vast and exceptionally complicated region, even when the reports of others were combined with personal experience. His prime interest was navigational rather than geographical.

It was upon such fragmentary evidence, collected over long periods of time, that names were coined or, more often, repeated by those who compiled the ancient sources upon which we now depend. Most authors appear to have borrowed all or the greater part of their geographical information. The same major regional names are frequently mentioned. In effect, these are mental maps, images of reality, perpetuating traditional ideas, and stemming from a nucleus of information based on hard experience. The actual territories represented by these names are never defined or even properly identified, for the simple reason that the authors or editors of our sources did not know themselves.

The most common names—unquestionably referring to South East Asia in some sense—incorporated the Sanskrit word *suvarṇa*, gold: *Suvarṇabhūmi* (Pāli, *Suvaṇṇabhūmi*), land of gold, and *Suvarṇadvīpa*, island or peninsula of gold.[129] This is the principal basis of the inference that Indian merchants saw South East Asia as a wealthy region, a land of opportunity; the reasonable inference, too, that the prospect of substantial material gains was a significant part of the reason behind exploration eastward in the first place. Both names are ancient, belonging to the second half of the first millennium B.C.; one or other, but apparently not both, occurring in the *Rāmāyaṇa*, Kauṭīliya's *Arthaśāstra*, the *Milinda-Pañho*, the *Jātaka*, Somadeva's *Kathāsaritsāgara*, and the *Mahāvaṃsa* of Sri Lanka. The two names almost certainly do not correspond to mainland or peninsula and archipelago, a distinction evidently first drawn by the Chinese ca. 800.[130] In fact, little should be made of the difference between *-bhūmi* and *-dvīpa*, which could mean simply land or region; nor between *Suvarṇadvīpa* and *Suvarṇakuḍya*, wall or frontier of gold[131]—all amounted, in the opinion of Paul Wheatley, to little more than "a beckoning eldorado beyond

the ocean."[132] Most of the above sources refer to perilous voyages or to shipwrecks. The *Jātaka* tell of sailings to the 'Gold Country' or to *Suvaṇṇabhūmi* to "get great riches there."[133] It would be reasonable to suppose that these ancient and related, if not identical, territorial names referred, or referred in the first place, to the more accessible parts of South East Asia: lower Burma, the west coast of Malaya, northern Sumatra, and, if use was made of the Sunda Strait, western Java.

The appelation 'gold' or 'golden' (*Khrüse*, *Chryse*) was picked up by the classical authors of the first century (Pomponius Mela, Pliny, the *Periplus*[134–136]). Ptolemy in the second century has *Khrysoanas* (river of gold), *Khrüsēs Khora* (land or region), and *Khrüsēs Kersonēson* (peninsula)[137] and records that the last of these was known to Marinos of Tyre (late first century A.D.).[138] Such reports are as much as half a millennium later than the earliest Indian sources.

The Arabs identified *Suvarṇadvīpa* or *Suvarṇabhūmi* with their *Zābaj*,[139] generally understood to have extended from southern Malaya to Sumatra and probably western Java, in other words the kingdom of Śrī Vijaya or the "empire of the Mahārāja." Chinese and Tibetan sources, of roughly the same period, also refer to the "island(s) of gold."[140] *Dvīpāntara* (the archipelago) of Kālidāsa's *Raghuvaṁśa*—whence breezes reputedly carried the scent of cloves to Kalinga (*supra* p. 52)—broadly corresponded to Chinese *K'un-lun*, the islands and inhabitants of maritime South East Asia.[141]

A lower tier of names of territories within *Suvarṇadvīpa*[142] can sometimes be identified with reasonable confidence. A few are ancient. *Malayadvīpa* (Sumatra) occurs in the *Purāṇas* (ca. fourth or fifth century),[143] *Yāvadvīpa*, Prākṛt *Yāvadīvu* (Java and probably parts of adjacent islands, Sumatra and Kalimantan), in both the *Purāṇas* and the *Rāmāyaṇa*.[144] *Yāvadīvu* is Ptolemy's *Iabadiou*;[145] this and the capital city of *Argyre* (Silver) are "further testimony to ancient trading activities in western Java."[146] *Suvarṇapura*, mentioned in the seventh century,[147] has not been identified. *Karpūradvīpa* presumably refers, in a collective way, to the camphor-producing lands of southern Malaya, northern Sumatra, and northwestern Borneo.[148]

A third tier of names corresponds to what survives today. A substantial proportion of Indonesian topographic and settlement names are either Sanskritic or incorporate Sanskritic elements, albeit, in some cases, in "much corrupted form."[149] Many had counterparts in ancient India.[150]

Sanskritic Inscriptions

The earliest Indian inscriptions, such as the edicts of Aśoka (d. 232 B.C.), are in Prākṛt. The oldest form of Sanskrit or Old Indo-Āryan is the language of the

Ṛgveda; from a dialect of this language classical Sanskrit developed. Epigraphical use of classical Sanskrit spread, broadly from north-west to south-east, at the expense of Prākṛt, reaching South India by the fourth century. A mixture of Sanskrit and Prākṛt is found in a number of inscriptions dating from the second and third centuries.

Early Sri Lankan inscriptions, from the fourth century, are chiefly in Prākṛt,[151] Sanskrit (from the seventh century) is rare.[152] The great majority, including the oldest inscriptions in South East Asia, mainland and archipelago, are in Sanskrit, very few in Pāli (Burma).[153] "Excepting one case of Prākṛt intrusion, there is not a single non-Sanskritic Indian word in the charters of central Java, numbering over 100"; all are in Sanskrit or Old Javanese.[154] Likewise, there are almost no Prākṛt or Draviḍian loan-words in Old Javanese.[155] On the other hand, three Tamil inscriptions and another in both Tamil and Sanskrit have been reported from Malaya, Sumatra and Burma. These are particularly interesting for, alone, they indicate from what part of India some of the immigrants came.

From the seventh and eighth centuries, Old Malay and Old Javanese (Kawi), both with many Sanskritic words, are recorded in Indian scripts;[156] Cham, from one of the earliest areas of Indian settlement (*Campā* or southern Annam), in the second half of the fourth century;[157] and Old Peguan (Talaings) in central Burma in the eighth century, but possibly as early as the fourth or fifth century.[158]

South East Asian inscriptions, with a few exceptions, are in one or other of two Indian scripts: the earlier is Pallava-Grantha from South India, the other Pre-Nāgarī from the North East. With Pallava-Grantha came the Śaka era (commencing A.D. 78), which prevailed in southern India and was used in the dated Sanskritic inscriptions of South East Asia. Pre-Nāgarī appears in Java in the second half of the eighth century.[159] Some short inscriptions on seals and rings are in the most ancient Indian scripts, Brāhmī and Kharoṣṭhī. A fragment of Romano-Indian rouletted ware, found at Sembiran in northern Bali and dating from the first or second century A.D., has an inscription in Kharoṣṭhī, possibly of Bengali provenance.[160]

The oldest Sanskritic inscription in South East Asia was found at Vō-caṇh in eastern Fu-nan (Map 3 [1]), later known as Campā. The text is dated epigraphically to about the third century A.D. (range second–fourth centuries).[161] Inscriptions at Cho'-din, Hon-cuc, and Mu-s'on [2] to the north of Vō-caṇh, belong to the middle to late fourth century.[162] Others from Fu-nan and its successor state, Cambodia, fall between the fifth and the seventh centuries.[163] The earliest within peninsular Malaya, at Kĕdah (Kaḍāram) [3] and in North Wellesley province [8], also have been placed in the fifth century.[164] Somadeva's *Kathāsaritsāgara,* compiled in the eleventh century, refers explicitly and repeatedly to trading connections with Kĕdah (*Kaṭāha*).[165]

The most ancient (late fourth century) inscriptions from the Indonesian archipelago come, rather surprisingly, from Mudra [Muara] Kaman in Kutei, eastern Borneo (Kalimantan) [6].[166] Eight short pieces from southern Borneo [7] date from the fifth to sixth centuries.[167] In much the same chronological position are finds in western Java (mid-fifth century) and central Java (fifth to seventh centuries).[168–169] Inscriptions in both Sanskrit and Old Malay in Sumatra belong to the seventh century.[170] Evidence of Sanskrit in Bali dates from the eighth to the tenth centuries.[171] Sanskrit was still in use in Java as late as the fourteenth century but, mixed with Indonesian words, the meaning is sometimes obscure or even unintelligible.[172]

In all these records, from the mainland and the archipelago, India itself is rarely mentioned. Moreover, little can be concluded from the adventitious distribution of known sites. Fu-nan and Campā together stand out as an area of very early settlement. The Malay peninsula, too, is early, and the tide of Indian influence clearly passed from western to central and finally to eastern Java and Bali. If Sumatra lay on the southern flank of *Suvarṇabhūmi*, it is surprising that no inscription of very early date has so far been found there.

Tamil Literature, Coins and Inscriptions

With one important exception, the Indian contribution to South East Asia carries no clear regional imprint. The homelands of traders and immigrant priests are generally unknown. The exception is the southeastern quadrant of the subcontinent, where Tamil, the major Dravidian language (Map 2), is spoken. Tamil influenced the early scripts, languages, and literature of the Malay peninsula and Eastern archipelago.[173] There are at least two early (second to sixth centuries) literary references in Tamil to connections with South East Asia and three later (seventh to eleventh centuries) Tamil inscriptions in South East Asia—two in Malaya and one in Sumatra.

There were important centers of Buddhism and of maritime trade in the coastal lands of eastern India even before the rise of the powerful Pallava dynasty in the fourth century.[174] Directly across the Bay of Bengal lay Burma and the long peninsula of Thailand and Malaya, effectively the eastern limit of the known world to classical authors. The Greek *Periplus of the Erythraean Sea* (ca. A.D. 50) names three ports, *Kamara* (Kāverīpaṭṭinam), *Podoukē* (near Pondicherry), and *Sōpatma* (Markanam) (Map 3), from where "the largest ships" (*kolandiophōnta*) sailed eastward to *Khrūsē*.[175] Ptolemy of Alexandria (ca. A.D. 100–178), where at least "a few Indians"—presumably merchants—forgathered,[176] put the point of departure (*aphetērion*) for the Golden Kersonese (*Khrūsēs Kersonēson*) farther north, off *Maisoloi* (Masalia).[177] North again,

Tāmraliptī (Tamluk), at the mouth of the river Hooghly, was the port from which two Chinese pilgrims, Fa-hsien[178] in the early fifth century and I-Tsing[179] at the close of the seventh century, embarked on their return voyages to China. A third pilgrim, Hsüan Tsang (629–645), wrote of the town of *Charitra* [*pura*] (? Puri, Map 2) in *Utkala* (Orissa), whence "merchants depart for distant countries."[180]

The earliest, outline illustrations of Indian sea-going ships, two masted and square-rigged, are on second-century coins of the Andhra dynasty of Coromandel,[181] roughly contemporaneous with Ptolemy. Similar ships appear on Pallava coins of the fourth century. The opening centuries of the Christian era witnessed not only an increase in size, but also improvements in the design of ships operating in the Persian Gulf and the Indian Ocean. Two- and three-masted Indian vessels, with high, narrow sails and fore-and-aft rigging, "combined the manoeuvrability of the light Arabian dhows with the large carrying capacity of the far less mobile Roman merchantmen."[182] It is unlikely that any Chinese *junk* or Indonesian *jong* could match the seaworthiness and technical efficiency of the kind of ship shown in the frescoes of Ajanta (Figure 13).

The earlier of the two Tamil literary references to South East Asia is in the poem *Paṭṭinappālai*, from about the beginning of the third century, in which *Kāverīpaṭṭinam* (Puhār) imports goods from *Kaḍāram* (Kēdah)[183] on the western seaboard of the Malay peninsula (Map 3). The second notice comes from the epic *Śilappadikāram*, probably composed in the second century, but amended and expanded up to the sixth century. Here we are told that the Pāṇḍyan capital of Madurai received 'tribute' from *Toṇḍi*, evidently somewhere in the Eastern archipelago—namely sandal, aloeswood (*Aquilaria agallocha*), spices (*vāsam*), silk, and camphor, which arrived "[on] the east wind (*Koṇḍal*) [in] a fleet of high, broad ships."[184] An early commentator on this passage included nutmeg (*jātikkāy*) among the spices, a later (fourteenth century) commentator both nutmeg and cloves, *lavaṅgam*.[185] The number of Tamil loan-words in Indonesian may have steadily increased up to the fifteenth century, as they are known to have done since then.[186]

The earliest Sanskritic inscription in South East Asia, from Vō-caṇh in Campā, undated but usually assigned to the third century, contains a Tamil royal title.[187] The first Tamil inscription (seventh to ninth centuries) comes from Khao Phra Narai at *Takuapa* (Ban Takūa-pā), Ptolemy's *Takola*,[188] on the west coast of Malaya[189] (Map 3). This refers to a tank or artificial lake under the protection of a "guild of merchants" (*maṇigrāmam* or *manikkiramam*, from Sanskrit *vanik-graman*), a term also found in Tamil inscriptions in southern India. It is generally agreed that the evidence from *Takuapa* implies a sizable colony of traders and attendant guards. An inscription at Loboe Toewa (Labu Tuwa) near *Baros*, a port famous for camphor on the northwestern coast of

Figure 13. An ocean-going vessel, fresco (ca. A.D. 500–550) at Ajanta, south-central India (Yazdani and Bynyon, 1930–1955: II: pl. XLII)

Sumatra, mentions a similar guild (*tiśaiyāyirattu-aiññurruvar*) and is dated 1088.[190]

The third Tamil inscription, from Wat Mahathat in *Ligor* (tenth to eleventh centuries), Malaya, is unfortunately "too mutilated to be useful."[191] In 1025, Cōḷa fleets from Coromandel under Rājēndra I (ca. 1014–1044) raided the empire of Śrī Vijaya and captured *Kaḍāram* (Kēdah).[192] By contrast, the Śailendras, Buddhist rulers of Śrī Vijaya, founded sanctuaries at Nālandā (ninth century) in southern Bihār and at *Nāgīpaṭṭana* (Negapatam), ca. 1005, on the coast of Coromandel.[193]

Finally, there is a hybrid inscription from a site near Pagān, in central Burma. This comprises a verse in Sanskrit and a prose passage in Tamil and thirteenth-century script recording gifts "by a native of *Malaimaṇḍalam* (Cranganore) in Malabar to the Vishṇu temple at Pagān.[194]

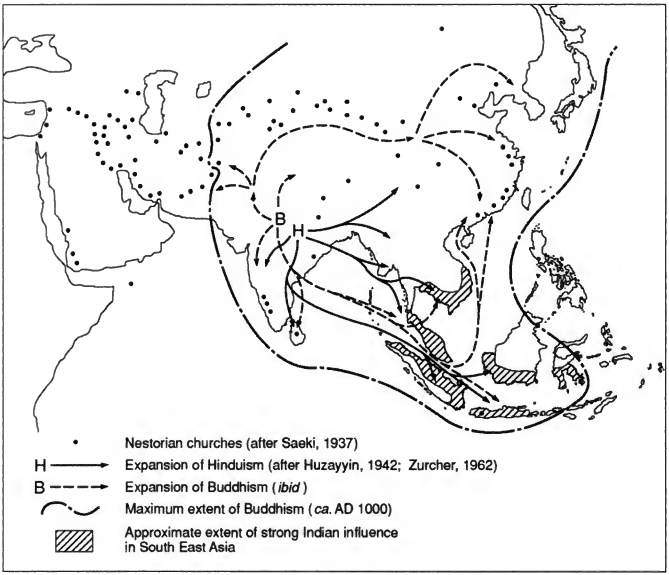
Religion

The transformation of southern Asia from ca. 1000 B.C. to ca. A.D. 1000 has been variously described, always with only partial justification, as 'Indianization' ('India' was no more than a geographical expression), 'Aryanization', 'Sanskritization,' and, perhaps most meaningfully, as 'Brahmanization' (Sanskrit *Brāhmaṇa*: *brāhman*, worship, prayer), "the interaction between representatives of the Great Tradition of India on the one hand and Draviḍian...and South East Asian elements on the other."[195] The connection with South East Asia was both by land, through Burma, and by sea, although long sea voyages, when laws of ritual purity were virtually impossible to obey, were not favored by brahmans, indeed prohibited in Manu's *Dharmaśāstra* (first to second centuries). The same constraint did not apply to the more open and less ritually elaborate Buddhism, which commenced to spread, again chiefly south and east (ultimately as far as China and Japan) from a homeland on the middle to upper Ganges about 500 B.C. (Map 4). The expansive nature of later Mahāyāna Buddhism added immeasurably to the strength and direction of Indian penetration of South East Asia. The literature of Buddhism from the time of the Mauryas under Aśoka (converted ca. 260 B.C.) is full of references to sea-going ships and to the perils of ocean travel.

Hinduism and the idea of divine kingship (*devarāja*) and associated court ritual were paramount features of the first generation (first to mid-seventh centuries) of Indianized kingdoms in mainland South East Asia (Map 3). The names of royalty are mainly in Sanskrit, ending in *-varman* This form of socio-territorial organization spread to the archipelago, as far as eastern Indonesia, before the arrival (ca. 1275) and expansion of Islam in southern Malaya, Sumatra, Java, Borneo (after 1500), and the Moluccas, but no other large part of the mainland, nor, among the islands, to Bali, Timor and most of the Philippines.

Hindu temples and Buddhist monasteries, like princely courts, were centers of economic activity and specialized demand. They accumulated, primarily through donations (*dāna*), land, labor, and capital in the form of treasure and precious commodities. Their patrons and benefactors ranged across the whole social spectrum, but kings, other large landowners and rich merchants were naturally most prominent. Economic activity consisted of estate management (especially under Brahmanism), craftsmanship and, in the case of Buddhism, the promotion of, and even some participation in, trade; all of which benefited the local and regional economy. There is a close parallel with the work of the monasteries of medieval Europe.

Buddhism and Jainism—contemporary departures from Hinduism—adopted a more liberal attitude than did Brahmanism to the amassing of wealth (and consequential social status), entrepreneurship, travel, and trade.[196] They also



MAP 4. The expansion of Hinduism [Brahmanism] and Buddhism and the distribution of Nestorian sites.

were more closely associated with urban settlement, modes of communication, and avenues of commerce, the last, in part, both the cause and the effect in India and subsequently in South East Asia of the siting of monasteries (*saṅgha*).[197] The *saṅgha* itself was a most important innovation in the practice and organization of eastern religion.

The first identifiable patterns of long-distance commerce in luxury commodities and of the spread of monastic communities date from the third century B.C.[198] The success of Buddhism was closely related to the interest and generosity of the urban élite. In return, traders by land and sea enjoyed the special protection of the *bodhisattva* Avalokitesvara. Talismanic images of Buddha as Dīpaṅkara (calmer of the waters)[199] have been found in Thailand, Vietnam, Sumatra, eastern Java, and Sulawesi.[200] Buddhism also tended to promote the spread of literacy, to facilitate the collection and circulation of information, and to encourage the use of coinage, which was unknown in South East Asia until about the middle of the first millennium. Many coins, seals, and pottery carried Buddhist symbols.

The number of monasteries in southern and eastern Asia increased substatially between ca. 200 B.C. and A.D. 300. The evidence is preserved in inscriptions, innumerable abandoned monastic sites, *stūpas* and *dāgābas*,[201] and in statues of Buddha or one or other *bodhisattva* in the Amarāvatī (second to fourth centuries) and Gupta (fourth to sixth centuries) styles.[202] Finds in Sulawesi from the third century suggest that Buddhism quickly reached its maximum territorial limits. Departures from the shores of India for nearer destinations antedate the rise of the Pallavas (ca. 350). The testimony of Ptolemy and the Greek *Periplus* (first–second centuries) point to coastal traffic between Sri Lanka and Bengal, and from Bengal eastward to Burma and Malaya.[203] The origins may go back to the time of the pearl-rich Pāṇḍyas (fourth century B.C.).

Contact with the Golden Khersonese was by no means restricted to the east-coast ports. *Bharukacc'a* (*Barugaza*, Broach), *Śūrpāraka* (Sopara), and Muchiri (*Mouziris*, Cranganore) were also in touch.[204] One of the ancient folktales in the *Jātaka* tells how merchants sailed to *Suvaṇṇabhūmi* from *Bharukacc'a*.[205] Kauṭīliya's *Arthaśāstra* records that Chandragupta I (ca. 298 B.C.) employed a "Controller of Shipping" (*Nāvadhyaksa*),[206] with additional responsibility for the management of ports and ferries, which suggest a high level of organization. According to the *Milinda-Pañho* (first century A.D., the surviving text no later than the fourth century), a wealthy Indian shipowner might expect to sail—or dispatch ships—to lands as far apart as Egypt and China[207]—Sūrat (Gujarāt), *Vaṅgala* (Bengal), *Sauvīra* (lower Indus), Alexandria, Coromandel, *Takkola* (Takuapa) on the west coast of the Malay peninsula, *Suvaṇṇabhūmi*, and *Cīna*.

The diffusion of Indian art,[208] chiefly sculpture and iconography, to South East Asia was accompanied or preceded by the introduction of basic skills, notably brick-making and stone-working, and, initially, of Indian craftsmen. The products, like the art of medieval Europe, were overwhelmingly religious. The imprint of Amarāvatī (second to fourth centuries) is now everywhere faint; later Indian styles (Gupta, Pallava, Nālānda-Pala) are better represented in Burma, Thailand, Cambodia, Malaya, and Indonesia. The architecture that has survived is all relatively late (from the eighth century) and distinctively Indonesian. Kalasan (late eighth century) and Borobudur (mid-ninth century) in central Java are spectacular examples. The *Mānāsara*, a Hindu treatise on architecture—canons of building and decoration—probably provided an initial theoretical framework, but "it is not a guide to Indo-Javanese art in the form in which it has been handed to us."[209] Nor does any particular Indian building appear to have been notably influential.

The reduced appeal of Buddhism by about the middle of the first millennium was compensated by a resurgence of Brahmanism under the Guptas and the building of substantial temples dedicated to Śiva and Vishṇu. The "fusion of the Brahmanical and Buddhist ritual character [eroded] the separate identity of Buddhism, leading to its eventually being subsumed in the Brahmanical fold."[210] Temples and monasteries remained, however, focal points of demand for precisely those luxury products for which there was also a strong market in India itself and the medieval West. All looked to Indonesia, and more especially eastern Indonesia, for the rarest spices and the choicest aromatic woods. There were customers at each stage of the long journey from the Moluccas and Timor, matched by steadily rising prices, ensuring that a proportion reached the West.

Motivation

The reasons behind Indian expansion into South East Asia can only be a matter of informed speculation based on the apparent results of such expansion. Certainly there was no single driving force, but rather a combination of compatible, indeed mutually supportive, commercial and religious objectives. No mass migration of population has ever been proposed. On the other hand, a substantial number of priests and scholars must, over time, have been involved, if we are to account for the striking success of Brahmanism and Buddhism and the introduction and long-term influence of Sanskrit. I-Tsing was able to study Sanskrit in *Srībhoga* (Palembang), capital of Śrī Vijaya, for six months in 671–672 before continuing his journey to India. On his return in 685 he spent the greater part of ten years again examining and translating Sanskrit and Pāli texts.[211] Today, a large number of Indonesian words are rooted in Sanskrit.

The religious conquest of South East Asia was pioneered by brahmans, notwithstanding their formal reservations about long sea voyages. The earliest Sanskrit inscriptions of the Malayo-Indonesian archipelago are all brahmanical. When the Buddhist Fa-hsien visited Java on his return to China from Sri Lanka, ca. A.D. 414, he remarked that the bulk of the population were 'heretics,' that is followers of Brāhman.[212] Buddhist expansion was at first directed towards Central Asia and China (first century A.D.). In Java, Buddhism only took the lead after the arrival from northern India of Guṇavarman in the early fifth century—first southern *Hīnayāna*, then, from the eighth century, northern *Mahāyāna*. I-Tsing (688–695) reported that there were over one thousand Buddhist priests in *Srībhoga*.[213] Clearly, there had been great changes since the visit of Fa-hsien.

The observable legacy of India's connection with South East Asia, and with Indonesia in particular, derives largely (as is the usual colonial experience) from the presence of an educated élite and of the workforce that it commanded, whether Indian or, more probably, Indonesian. The commonly recognized divisions within the élite should not be taken as rigid: brahmans could and did trade, warrior princes (*kṣatriyas*) and some merchants were versed in Sanskrit culture.[214]

Early commercial objectives are implicit rather than explicit, evidence of trade mainly indirect. An exception is the discovery of Romano-Indian rouletted ware, belonging to the first two centuries A.D., in extreme northwestern Java and at Sembiran in northern Bali[215] (Map 3). The reputed wealth of South East Asia was reflected in the earliest Sanskritic toponyms. The two principal sources of gold, Malaya and Sumatra, lay directly across the Bay of Bengal. At the same time, the 'gold' of *Suvarṇabhūmi* was probably as much symbolic as real. Whether a reduction in the flow of gold to India from Siberia (on account of political disorder) and a ban by the Emperor Vespasian (A.D. 69–79) on its export from Rome[216] were decisive in prompting Indian interest in South East Asia is at least doubtful. The first century seems too late. By then an awareness of trade across and to the east of the Bay of Bengal had not only reached the Mediterranean lands but had been incorporated in the *Periplus* and, a little later, in Ptolemy's *Geōgraphikē Huphēgēsis*.

The realizable wealth of South East Asia consisted not so much of precious metals but of exotic vegetable products, spices, materia medica, and aromatic woods. A large demand for these arose in all centers of advanced civilization: Egypt and the Mediterranean, India and Mesopotamia, and, to the east, China. For lands to the west of the Arabian Sea, India was the proximate supplier. India itself was not only a major consumer of aromatics for purposes of religion and personal hygiene, but also a leader in the use of drugs in medicine, as

shown in the works of Caraka and Suśruta (*supra* pp. 50–52), by at least the beginning of the Christian era. Indian medical lore and practice spread into the Near East and to South East Asia.[217]

The maritime networks of South East Asia, local and regional and initially, and perhaps always predominantly, coastal, arose in Neolithic times, millennia before the earliest firm evidence of Indian influence. Etched beads of Indian origin, found in South East Asia, date from ca. 300 B.C. In time, local networks must have been exploited by long-distance traders or by intermediaries to tap supplies of *aromata* in western and central Indonesia. The suppliers were necessarily Malays or Indonesians with contacts, in their turn, as far east as the Moluccas. Indian merchants apparently never ventured much beyond Java. O. W. Wolters thought that a place or region known in Chinese transcription as *Chia-ying* (*Ko-ying*), somewhere in western Indonesia—Sumatra or western Java—was the terminus of early Indian shipping, an entrepôt for goods moving east and west. Amazing as it may seem, *Ko-ying* in the early third century imported horses from Yüeh-chih, northeast of Sogdiana.[218]

The expansion of Brahmanism and Buddhism, with their own large demand for aromatic substances and, in the case of Buddhism, a tolerant attitude toward travel and trade, could only strengthen the ties with South East Asia. The symbiosis between commerce and religion was the key to the remarkable expansion of Indian influence in the direction of sources of supply of the most distinctive of Indonesian spices, cloves and nutmeg, and the finest sandalwood. An important clue to an early connection with South East Asia lies in the evidence, albeit difficult to date and to evaluate, for the introduction (or more probably repeated introduction) of white sandalwood from Timor to southern India, a feat comparable to, but evidently much earlier than, the passage of silk-rearing from China to the eastern Mediterranean.

Notes

1 Sköld, 1926: p. 244. On the *Nighaṇṭu* and the *Nirukta*, see Lakshman Sarup (ed. and trans.) 1920–1921.

2 R. P. Kangle (ed. and trans.) 1960–1965: 2: pp. 115–117.

3 Ray and Gupta, 1965: p. 60[116]. Kangle in Kauṭiliya (1960–1965: 2: p. 117) has "also a kind of fragrant substance."

4 E. B. Cowell (ed., "translated from Pāli by various hands") 1895–1913: IV: pp. 133[476], 166[483].

5 Fa-hsien (trans. H. A. Giles) [1877] 1956: pp. 30–31, 71–73. Cf. Lévi, 1918: pp. 105–106 (*santal gośīrsa*).

6 Stein, 1907: 1: p. 447.
7 V. R. Ramachandra Dikshitar (ed. and trans.) 1939: pp. 90, 108, 119, 146, 184, 191, 195, 203 (red sandalwood), 234, 284, 285, 299, 318. Remarks of commentators on the *Śilappadikāram*, up to the 14th century, strengthen the association with Indonesia and with nutmeg and cloves (Nilakanta Sastri, 1944: pp. 26–28).
8 Lévi, 1918: pp. 104–111; *The Rāmāyaṇa of Vālmīki* (trans. H. P. Shastri) 1952–1959: 2: pp. 530 (*chandana*), 531 (*goshirshaka*), 535 (*raktachandan*), 3: pp. 692 (*goshiraka*), 693 (*kalagura, kāleyaka*); Lad, 1983 (on the *Mahābhā -rata*): pp. 18–19.
9 According to Shastri (*Rāmāyaṇa*, 1952–1959: 2: p. 530, 3: p. 691) *chandaka* = clove tree, but I cannot find this synonym elsewhere. See also Gonda, 1932; p. 326 (*lawaṅga*).
10 *Matsaya Purāṇam* (trans. Taluqdâr of Oudh) 1916–1917: II: pp. 228, 230. Banerji (1980: pp. 44, 55) quotes the *Matsaya* under *jātiphala* (presumably nutmeg) and *lavaṅga*; *jāti* appears in Taluqdâr's commodity lists, but I find no reference to cloves.
11 Nilakanta Sastri (trans. of ch. 48) 1937: p. 115.
12 *Milinda-Pañho* (ed. and trans. T. W. Rhys Davids) 1890–1894: 1: p. 29, 2: p. 307.
13 W. Geiger (ed. and trans.) 1950: p. 79.
14 Ray and Gupta, 1965: pp. 1–4.
15 *Caraka Saṃhitā*, 1949: V [English translation]: p. 33.
16 Ibid: p. 878.
17 *Suśruta Saṃhitā* (ed. and trans. K. K. Bhishagratna) 1907–1918 [1963]: 1: pp. 507, 562, 3: p. 483.
18 A. F. R. Hoernle (ed. and trans.) *The Bower Manuscript*, 1893–1913: 2: p. 92 [129] and n. 83.
19 Ibid: p. 36 [187].
20 *Agni Purāṇam* (ed. and trans. M. N. Dutt) [1903–1904] 1967: pp. 802–803; *Garuḍa Purāṇam* (ed. and trans. M. N. Dutt) 1968; pp. 634, 666 (fumigation stick with *jātipatram*), 673 (oil with sandalwood, camphor, nutmeg, clove).
21 Amarasiṃha's *Amarakośa* (ed. and trans. N. G. Sardesai and D. G. Padhye) 1940: pp. 62, 63, 129, 138, (ed. and trans. H. D. Sharma and N. G. Sardesai) 1941; pp. 159–161, 319.
22 Kālidāsa *Raghuvaṁśa* (trans. P. de Lacy Johnstone) 1902: pp. 32, 33, 52, 54, 57, 132; ibid. (trans., canto I–V only, M. A. Karandikar and S. Karandikar) 1953: IV: paras. 48, 51, and notes 214–216.
23 Kālidāsa, 1902: p. 54 (lines 190–191). On *Dvīpāntara*, see Nilakanta Sastri, 1944: p. 28; Adhya, 1966: p. 173; Wolters, 1967: p. 66; Wheatley, 1983: p. 267.

24 Rājaśekhara (trans. N. Stchoupak and L. Renou) 1946: p. 59.
25 Monier-Williams, 1899: p. 792.
26 Kālidāsa *Kumārasaṃbhāva* (trans. H. Heifetz) 1985: VIII: p. 25.
27 Bāṇabhaṭṭa (trans. E. B. Cowell and F. W. Thomas) 1897: p. 214.
28 Vidyākara (trans. D. H. H. Ingalls) 1965: pp. 320, 322 [verse 1132].
29 Bhavabhuti *Mālatīmādhava* (ed. and trans. M. R. Kāle) 1967: p. 93 [X, 3].
30 Somadeva (trans. C. H. Tawney and ed. N. M. Penzer) 1924: VIII: p. 96.
31 Bretschneider [1888] 1910: 1: p. 146.
32 Dey, 1896: p. 70; Chopra, 1933: pp. 86–87; Chopra, Nayar, and Chopra, 1956: p. 238. From Sri Lanka, Johan Nieuhof [1682] (1732/1988: p. 165) reported an "abundance of wild clove trees, but bear no fruit," possibly further confusion with cinnamon.
33 François Pyrard of Laval [1601-1611] (ed. and trans. A. Gray and H. C. P. Bell) 1887–1890: 2 (1): pp. 167–168.
34 Dey, 1896: p. 198. See also Ainsley, 1826: p. 250 (Tinnivelly and Sri Lanka); Drury, 1873: p. 306 (west coast of India).
35 Chopra, Nayar and Chopra, 1956: pp. 172–173.
36 Fischer (1938: p. 460), commenting on Rājaçekhara's *Kāvya-Mīmāmsā* (ca. A.D. 900), identifies *kakkolaka* from Malabar (*Malaya*) as nutmeg, rather than cubeb (Ray and Gupta, 1965: p. 60, *kakkola;* cf. Monier-Williams, 1899: p. 241, *kakkola, kakkolaka*).
37 Ma Tuan-lin (trans. Le Marquis d'Hervey de Saint-Denys) 1876: p. 573.
38 Buchanan [Hamilton] 1807: 3: p. 161; Logan, 1887: 1: p. 47; Dymock, 1889: 3: p. 197; Chopra, 1933: p. 195 (Nilgiris and Malabar).
39 Lamarck, 1791: p. 162; Warburg, 1897: pp. 403–409. "It appears from ancient records," according to Chopra (1933: pp. 195–196), "that the nutmeg tree flourished in India at one time," but he gives no specific authority.
40 Lévi, 1918: pp. 110–111; Phalgunadi, 1991: p. 22.
41 Kauṭiliya, 1960–1965: II: pp. 115–116 [43–55]—Sātana, Gośirṣa, Hari[deśa], Tṛṇasā, Grāmeru, Devasabhā, Jāpa, Joṅga, Turūpa, Mālā, *Kucandana,* Kāla, Kośāgāra, Śitodakā, Nāga, Śākala. Jāpa, Joṅga, and Turūpa were in Kāmarūpa (R. P. Kangle, ed. and trans., p. 116 n.). G. P. Majumdar (1934–1935: p. 653) has the same list with rather different transliteration.
42 Bāṇabhaṭṭā (seventh century) in *Harṣa-Carita* (1897: p. 214) refers to a gift of a variety of *candana,* known as *gośirṣa,* by the heir apparent of Assam. *Gośirṣa* also is listed by Kauṭiliya (note 41 *supra*) and described as "ox-head sandalwood" by Hsüan Tsang [629–645] (trans. S. Beal) [1881] 1958: 3: pp. 366, 369.

43 Kālidāsa, 1902: pp. 32–33, 1953: [51], 1985: viii. 25; and in Upadhyaya, *India in Kālidāsa*, 1947: pp. 40, 261.
44 Hsüan Tsang [1881], 1958: IV: p. 432.
45 Rājaśekhara, 1946: pp. 133, 216.
46 Monier-Williams, 1899: p. 118; Hsü Yün-ts'iao, 1967: p. 173 (*candanadri*). Francis Buchanan [Hamilton] (1807: 1: p. 202) found that the best sandalwood came from just east of the Western Ghats.
47 *Garuḍa-Purāṇam*, 1968: p. 700; Monier-Williams, 1899: p. 792. See also Hsü Yün-ts'iao, 1967: p. 173 (*malayaja*).
48 Vidyākara, 1965: pp. 323 [verse 1138], 324 [verses 1143–1144].
49 Jahangir (ed. and trans. A. Rogers and H. Beveridge) 1909–1914: 1: p. 7.
50 Abū'l Fazl-i-'Allāmī (ed. and trans. H. Blochmann) 1873: p. 81.
51 Found in Hindī, Bengali, Marāṭhī, Gujarātī, Oriyā, Nepali, Lahndā, Pānjābī, Urdu (Hindustanī), Sindhī, Assamese, Kumaon, Dukhini (Dukni). Cf. Kaśmīrī *róng* (Elmslie, 1872: p. 12).
52 Ainsley, 1826: 1: p. 75; Dymock, 1889: 2: p. 20; Gwynn, 1991: p. 461 (cf. *lawanga patta*, cinnamon, also Gonda, 1932: p. 328).
53 Kittel, 1894: IV: p. 1435 (also, in Kannaḍa, cassia and cinnamon); Dymock, 1889: 2: p. 20; Nadkarni, 1976: 1: p. 835 (Kanarese).
54 *Tamil Lexicon*, 1924–1939: 1: p. 343 (also cinnamon tree, *Cinnamomum zeylanicum*, and wild cinnamon, *C. iners*). *Lavaṅga-pattai* = *C. zeylanicum* in Attygale, 1917: p. 140.
55 Aymonier and Cabaton, 1906: p. 76.
56 Watt, 1908: p. 527 (quoting F. W. Thomas, unidentified); Ferrand, 1913–1914: 1: p. 164 n. 8 (Bīrūnī's *lawang*: "Skr. *lavaṅga*, girofle, sans doute du malais *lāwaṅ*"); Petersson, 1916: p. 43, 1921: p. 189; Charpentier, 1919: p. 34; Gonda, 1932: pp. 326–329; Burrow, 1955: pp. 57, 378; Mayrhofer, 1956–1980: 3: p. 92.
57 Ainsley, 1826: 1: p. 75 (Java, *wohkayu lawang*, Bali, *bu-wah* [*buah*= fruit] *lawang*); De Clercq, 1890: p. 255 (Ternate, Moluccas, *bobolawa*= *boewah lawah*); Wilkinson, 1932: 1: p. 166 (Malay, *bunga lawang*, clove-spice; mace); Barber, 1979: p. 60 (Bali, *bwah lawang*); Zoetmulder, 1982: 1: p. 994 (Old Javanese, *lawanga*); Echols and Shadily, 1989: p. 332 (Indonesian, *lawang*, mace, clove flowers). Cf. Watson, 1928: pp. 74, 78 (*lawang* = *Cinnamomum* spp., *kulit* [bark] *lawang* = *Cinnamomum culilawan*, *lawang ayer* = *Anisophyllea apetala;* on *kulit lawang* in Ambon and Ceram, see Ellen and Glover, 1973: p. 366). The association of (or confusion between) cloves and cinnamon is of long standing and found in several parts of the Old

World. It has been suggested that *lavaṅga* was first used by Tamils for the flowers and fruit of Indian cinnamon and then transferred (perhaps around the first century A.D.) to "the similarly smelling clove of Indonesia" (Wolters, 1967: p. 280 n. 16).

58 Pigafetta (ed. and trans. R. A. Skelton) 1969: pp. 122, 170.

59 Laufer, 1916: p. 470 [91].

60 Burrow and Emeneau, 1961: p. 103.

61 Attygale [1917] 1952: p. 139; Clough, 1982: p. 676. Cf. Tulu *sādikè*, smearing (Burrow and Emeneau, 1984: p. 214 [2448]). Also *jatíka-patra* mace (Clough, 1982: p. 789).

62 Turner, 1966: p. 285; Sharma, 1972: p. 168; Singh and Chunekar, 1972: p. 167. *Jātī*-flower in Kauṭiliya *Arthaśāstra*, 1960–1965: 2: p. 117. *Jāti* generally = birth, family, community (Gonda, 1952: pp. 98–99, 210; Mayrhofer, 1956–1980: 1: p. 427; Schlerath, 1980: p. 69). *Jati* = teak [of Java] (Crawfurd, 1820: 1: p. 507; Rigg, 1862: p. 170; Gonda, 1852: p. 210; Barber, 1979: p. 234 [Balinese]; Echols and Shadily, 1989: p. 237). *Jatí* = a kind of fig tree (Clough, 1982: p. 188).

63 Monier-Williams, 1899: p. 814. See also Ray and Gupta, 1965: p. 66 [186]; Banerji, 1980: p. 57.

64 Burrow, 1946: p. 14. See also Burrow, 1955: p. 383. *Cantaṇa* in numerous compounds in *Tamil Lexicon*, 1924–1939: 3: pp. 1263–1265.

65 Bhaduri, 1931: p. 27.

66 Campbell, 1899 [–1904]: p. 88; Bodding, 1929–1936: 1: p. 574 (from Bengali *condon*).

67 Jäschke [1881] 1990: p. 655; Eitel [1888] 1894: p. 172 (*tsandan*).

68 Aymonier and Cabaton, 1906: p. 207.

69 Heyne, 1927: 1: p. 589; Gonda, 1952: p. 207.

70 Monier-Williams, 1899: p. 1290; Lévi, 1918: p. 105.

71 Hall, 1992: p. 308.

72 Lévi, 1918: p. 105. Cf Kauṭiliya, 1960–1965: 2: p. 115 ("blackish red and smells like fish"); Eitel [1888] 1894: p. 60 (copper brown in color).

73 Monier-Williams, 1899: p. 579, and p. 582 *pattūra* = red sandal; Shastri, 1959: 3: p. 693; Ray and Gupta, 1965: pp. 55 [50], 60 (*kāleyaka*). *Pātiram* is a loan-word in Tamil (*Tamil Lexicon*, 1924–1939: 5: p. 2508).

74 Philippus Baldaeus [1661-1672] 1704: p. 622 col. 2.

75 Vārahamihira (ed. and trans. H. Kern) 1875: pp. 110–116.

76 Abū'l Fazl-i-'Allāmī [ca. 1590] 1973: p. 73.

77 "Much used and spent all over India, by all the inhabitantes, [Indians], Moors, Heathens and Iewes, whatsoever" (Huyghen van Linschoten [1596–1598], ed. A. Coke Burnell and P. A. Tiele, 1885: 2: p. 103).

78 Fr Sebastien Manrique [1629–1635] (ed. and trans. C. E. Luard and H. Hosten, 1927: 1: p. 209) wrote of "palace rooms of odiferous woods," including sandalwood, in Arakan, Burma.
79 *Agni Purāṇam*, 1967: p. 802 ("powdered...and pasted with the juice of a *śhala* tree, then cut into sticks"); *Garuḍa Purāṇam*, 1968: p. 666 (with *jātipatram*). Majumdar, 1934–1935: pp. 658–659.
80 Gode, 1961: p. 39.
81 Turner [1783] 1800: p. 382.
82 Kālidāsa [ca. 450] *Raghuvaṁsá*, 1902: p. 33 ("Fine-powdered sandalwood, / Which the women of Karela wore, ...")
83 Hoernle, 1893–1912: 1: p. 13 n. 14 (quoting "Vāgbhaṭa's *Aṣṭāṅgahṛdaya*—paste of *chandana, karpūra*...); *Kathākoṣa* [Jain Stories] (ed. and trans. C. H. Tawney) 1895: p. 47; Jee, 1896: pp. 63, 82–83; Bāṇabhaṭṭa [7th century] *Kādambarī* (trans. C. M. Ridding) 1896: p. 120 (sandalwood juice, "sweet and cold as ice"), 1897: p. 214 ("stealing the fiercest inflamation away"); Rājaśekhara (ca. 900), 1901: pp. 226, 269, 1946: pp. 48, 278 (santal frais); Somadeva (eleventh century) 1924: VII: pp. 11, 12, 53, 99, 101, 113, VIII: p. 116, IX: p. 39; Kamat (*Karṇāṭaka*) 1980: pp. 23, 24 (paste of *śrīgandha*, sandalwood).
84 Donkin, 1999: p. 99.
85 Rājaçekhara, 1901: p. 277.
86 For sandalwood, see Somadeva *Kathāsaritsāgara*, 1924: VII: pp. 30, 72, VIII: p. 28; for camphor, Donkin, 1999: pp. 99–101.
87 Schafer, 1963: p. 136.
88 Kālidāsa [ca. 450] 1902: p. 32, 1953: [48] and pp. 214–215. The coils were thought to produce grooves in the trunks, which were used to attach securely the chains of elephants. Cf. Bāṇabhaṭṭa [7th century], 1896: pp. 5, 103; Vidyākara [8th to 11th centuries], 1965: p. 303; Rājaśekhara [ca. 900], 1946: pp. 133, 216; Sahlān ibn Kayṣān [d. 990] in P. Sbath, 1944: p. 186; *Hitopadeśa* (trans. F. Johnson, rev. L. D. Barnett) [9th–12th centuries] 1928: pp. 109–110.
89 Hsüan Tsang [629–645] 1958: IV: p. 432.
90 Rinpoche, 1973: p. 163, quoting an eighth-century source.
91 Turner [1783] 1800: p. 382.
92 On questions of toilet and personal hygiene, see Majumdar, 1934–1935: pp. 651–666, 1936: pp. 633–654.
93 *Agni Purāṇam*, 1967: p. 802. A similar oil is described in the *Garuḍa Purāṇam*, 1968: p. 673.
94 Geiger, 1960: p. 46.

95 Bāṇabhaṭṭa, 1897: p. 17; Majumdar, 1934–1935: p. 659, 1936: pp. 647–648; *Agni Purāṇam*, 1967: p. 803. Vārahamihira (*Bṛhatsaṃhitā* [sixth century], 1875: p. 116) described a method of cleaning toothbrushes, involving the use of nutmeg, as well as *tamāla* [betel]-leaf, cardamoms, and camphor. Portuguese women in India adopted the custom of Indian women in chewing cloves to sweeten the breath (Huyghen van Linschoten [1596] 1885: 2: p. 83).

96 Somadeva, 1924: VI: p. 27.

97 Ibid: VIII: pp. 241, 246–247, 255, 271, 274. See also Huyghen van Linschoten [1596–1598] 1885: 2: p. 67 (Paludanus—"cloves with areca nuts"); Jee, 1896: p. 69; Gode, 1961: pp. 129, 161, 181, 183; Sharma, 1972: p. 164 (betel nuts coated with *candana*). The medicinal benefits of betel are described in the *Hitopadeśa*, 1928: pp. 145–146.

98 Donkin, 1999: pp. 192–197.

99 Caraka, 1949: V: p. 33 [76, 77].

100 *Suśruta*, 1963: 1: pp. 507, 562, 2: p. 483 (areca nut, betel leaf, cloves, and nutmeg).

101 I-Tsing [671–695] (trans. J. Takakusu) 1896: p. 48 (areca nut [*pin-lang*], nutmeg, cloves, and *Baros* camphor).

102 Fa-hsien, 1956: pp. 71–73.

103 Hsüan Tsang [1881] 1958: 3: pp. 366, 369.

104 Vālmiki *Rāmāyaṇa*, 1952–1959: I: pp. 192, 194; Bāṇabhaṭṭa *Kādambarī*, 1896: p. 120; Rājaçekhara *Karpāra-Mañjarī* (ed. S. Konow, trans. C. R. Lanman) 1901: p. 278; Somadeva *Kathāsaritsāgara*, 1924: VII: p. 43, VIII: pp. 5, 6, 22, 168, 170, 171.

105 *Kathākoṣa*, 1895: p. 45; Fa-hsien, 1956: pp. 72–73; Manrique [1629–1635] 1927: 1: p. 230; Buzurg ibn Shahriyār (ed. and trans. G. S. P. Freeman-Grenville) 1981: p. 68.

106 Geiger (*Mahāvaṃsa*) 1960: p. 46.

107 Vārahamihira [sixth century] 1870: p. 234 [26–30]; Kalhaṇa [twelfth century] *Rājataraṅginī* (trans. R. S. Pandit) [1935] 1977: p. 11.

108 Sharma, 1972: pp. 169, 195.

109 *Mahāvaṃsa* (trans. W. Geiger) 1950: p. 79; *Cūlavaṃsa* [twelfth century] (trans. W. Geiger and C. M. Rickmers) 1929–1930: 1: p. 230 (sandalwood among offerings); Geiger, 1960: p. 14; Sharma, 1972: p. 169 (*jātiphala*). Some religious houses owned plantations of sandalwood.

110 Coedès, 1906: pp. 78–80.

111 Geiger, 1960: p. 46.

112 *Cūlavaṃsa*, 1929–1930: 1: p. 202 (between kings of Sri Lanka and Burma, eleventh to twelfth centuries).

113 *Śilappadikāram*, 1939: p. 204.
114 Somadeva *Kathāsaritsāgara*, 1924: VIII: p. 68.
115 Ibid: VII: p. 43.
116 Kālidāsa *Vikramorvaśí* (trans. E. B. Cowell) 1851: p. 51.
117 Chopra, 1933: pp. 86–87, 195–196.
118 Lad (1983: p. 7), writing of the *Mahābhārata*, observed that "spices were absent from the ancient diet." In Tibet, according to Samuel Turner ([1783] 1800: p. 382), "no sort of spice [was] used for culinary purposes." Upadhyaya (*India in Kālidāsa*, 1947: p. 40), on the other hand, maintained that "cloves, cardamom and black-pepper were used as food spices as now," but gives no examples.
119 Arasaratnam (*Coromandel*, 1650–1740) 1986: p. 107.
120 Coedès [1964] 1968: p. 15.
121 Donkin, 1998: pp. 154–155, and Map 21.
122 Chhabra, 1935: p. 64 (Java, Bali); Wheatley, 1983: p. 307 (Kampuchea [Cambodia]).
123 Stutterheim, 1925; Raghavan, 1980.
124 Chatterjee, 1927: p. 28 (Burma, Siam, Malaya, Cambodia, China).
125 Kauṭiliya, 1960–1965: 2: p. 117. Earliest reference in the *Rāmāyaṇa*, according to Wheatley, 1983: p. 264.
126 Raghavan, 1980 (Java, Malaysia, Philippines); Wheatley, 1983: p. 307 (Kampuchea); Phalgunadi, 1991: p. 21 (Bali).
127 Stutterheim, 1925 (vol. 2, plates).
128 Chaturvedi in L. Chandra (ed.) 1970: p. 182 (quoting Stutterheim, 1925).
129 Both mentioned by every author on ancient South East Asia; most cogently discussed, with full references, by Paul Wheatley, 1983: pp. 263–269, "The Realms of Gold." See also the pioneer study by R. C. Majumdar *Suvarṇadvīpa*, especially part 1, 1937.
130 Wolters, 1967: pp. 169–170.
131 Wheatley, 1983: pp. 264, 268.
132 Wheatley, 1961: p. 182, 1983: p. 267.
133 *Jātaka*, 1895–1913: III: p. 124 [no. 359], IV: p. 10 [no. 442], VI: p. 22 [no. 539].
134 Mela *De Chorographia* (ed. C. Frick) [1880] 1968: 3: pp. 70–71.
135 Pliny (trans. H. Rackham *et al.*) 1961–1968: 2: p. 399.
136 *Periplus* (ed. and trans. G. W. B. Huntingford) 1980: pp. 52[56], 54[60], 55 [63].
137 G. Coedès (ed. and trans.) *Textes*, 1910: pp. 38–43, 53, 56, 57, 60, 66; Ptolemaeus (ed. and trans. E. L. Stevenson) 1932: pp. 155–157.

138 G. Coedès (ed. and trans.) *Textes,* 1910: p. 38; Ptolemaeus, 1932: p. 35 (Book I, chs. xiii–xiv).
139 Al-Bīrūnī (ed. and trans. C. E. Sachau) 1910: 1: p. 210 ("the islands of the *Zābaj,* called by the Hindus *Suvarṇa-dvīpa*").
140 Majumdar, 1937: p. 41; Wheatley, 1983: p. 266.
141 Wheatley, 1961: p. 183, 1983: p. 267; Wolters, 1967: p. 153. *Dvīpāntara* is also mentioned in Somadeva's *Kathāsaritsāgara,* 1924: IX: pp. 35 ff: Cf. Nilakanta Sastri 'Dvīpāntara,' 1942: pp. 1–4 (associated with *Malayadvīpa*), and Ensink and van Buitenen, 1964: p. 91.
142 Wheatley, 1983: p. 268.
143 Ali, 1906: pp. 180–181; Tripathi, 1934: p. 121; Phalgunadi, 1991: p. 22. Braddell (1956: p. 4) agrees that *Malayadvīpa* = Sumatra; the name "occurs in Chapter 48 of the *Vāyu Purāṇa* [–A.D. 500] and apparently nowhere else in ancient Indian literature."
144 Vālmīki *Rāmāyaṇa,* 1952–1959: 2: p. 274 ("the island of the Seven Kingdoms *Yāva*").
145 G. Coedès (ed. and trans.) *Textes,* 1910: p. 61; Ptolemaeus, 1932: p. 157. *Yāva* (Skr.) = barley, Malay *jelai.*
146 Wolters, 1979: p. 28. The "preponderance" of Sanskritic and Prākṛt names in Ptolemy's account of South East Asia (Ray, 1994: p. 113) was earlier questioned by Wheatley, 1983: pp. 443–444 ("Recognizable Sanskrit words, explicit or inferred, are relatively infrequent").
147 Wheatley, 1983: p. 268.
148 Donkin, 1999: pp. 94, 171.
149 Ramachandran in L. Chandra (ed.) 1970: p. 80. See also Gonda *Sanskrit in Indonesia,* 1952: pp. 216–228 (geographical names).
150 Braddell, 1956: p. 12; Wheatley, 1961: p. 192.
151 Chhabra, 1935: pp. 10–11 (Anurādhapura, Veragoḍgala).
152 Ibid: p. 12 (Tiriyāy, Pankuliya, Kuccaveli).
153 Krom [1926/1931] (trans. H. B. Sarkar) 1957: p. 2 (Prome, sixth century).
154 Sarkar, 1969: p. 201.
155 Bosch, 1924: p. 7.
156 Krom [1926/1931] 1957: p. 65; Coedès, 1930: especially pp. 33, 38, 45, 46, 51 (with distribution map); Chhabra, 1935: pp. 29, 56; Sarkar, 1969: p. 193; Phalgunadi, 1991: p. 30.
157 Harrison, 1954: p. 18 n. 1 (Dong-yen-chau).
158 Krom [1926/1931] 1957: p. 2 (Lopburī).
159 Chhabra, 1935: p. 56.
160 Ardika and Bellwood, 1991: p. 225. See also Walker and Santoso, 1977: pp. 39–45.

161 Coedès, 1940: pp. 484–488. For a bibliography of this most important inscription, see Wheatley, 1983: p. 150 n. 5.
162 Majumdar, 1927: pt II: p. 3; Krom [1926/1931] 1957: p. 4; Chhabra, 1935: pp. 10, 28.
163 Coedès, 1931; pp. 2 (*Pràsàt Prăm Lovêṅ*, second half of the fifth century), 8 (Tà Prohm, province of Bàti, mid-6th century); Krom [1926/1931] 1957: p. 3; Chhabra, 1935: pp. 54, 59 (*Khan Theveda* [Phu-bo], early 7th century, *Srideb* [Śrí T'èp], 5th century, *Bayang*, 604 and 624). Chhabra (*op. cit*: p. 53) also refers to a Sanskritic inscription from *Phou Lokou*, Laos, but no date is given.
164 Krom [1926/1931] 1957: p. 13, Chhabra, 1935: pp. 14–20, and (pp. 20–27), *Ligor*, 775.
165 Somadeva, 1924: 1; pp. 155, 156, 163, 173, 174, 180.
166 Krom [1926/1931] 1957: pp. 6, 13; Chhabra, 1935: p. 38.
167 Chhabra, 1935: p. 41; Mabbett, 1977: p. 173.
168 Krom [1926/1931] 1957: p. 15 (Ci Sadane [9] near Buitenzorg; Tugu [4], east of Batavia [Djakarta]); Vogel, 1925b: p. 15 (Ci-Arutön, Jambu, Kĕbon Kopi, near Buitenzorg; Tugu); Chhabra, 1935: p. 31; Sarkar, 1969; p. 196.
169 Chhabra, 1935: pp. 31 (Tukmas [5]), 34; Vogel, 1936: p. 90; Majumdar, 1937: pt. I: pp. 150–151 (Kalasan, east of Jogjakarta, 778; Kĕlurak, near Kalasan, 782; Canggal, in Kĕdu, 732, the oldest dated inscription in Java); Gonda, 1952: p. 102; Krom [1926/1931] 1957: pp. 48, 74.
170 Coedès, 1930: p. 51.
171 Lévi, 1933: p. xi; Nilakanta Sastri, 1949a: p. 117 (896 is the earliest date on a Bali inscription); Gonda, 1952: p. 103.
172 Gonda, 1952: p. 103.
173 Nilakanta Sastri, 1944: p. 26.
174 Nilakanta Sastri, 1949: p. 121.
175 *Periplus*, 1980: p. 54 [60]. There also were "very large vessels made of single logs bound together and called *sangara*" (> Portuguese *jangada*, raft).
176 Dion Chrysostomus [ca. 40–115] (trans. J. W. Cohoon and H. L. Crosby), 1961–1964: 3: p. 211.
177 Coedès (ed. and trans.) *Textes*, 1910: p. 51; Lévi, 1925: p. 46; Ptolemaeus, 1932: p. 150.
178 Fa-hsien [1923] 1956: p. 65.
179 I-Tsing, 1896: p. 185. I-Tsing also arrived at Tāmraliptī (ibid: pp. xvii, 40, 211).
180 Hsüan Tsang, [1881] 1958: IV: p. 411. According to S. Beal (trans.), *Charitra* = Chinese Fa-hing, "city of departure."

181 Elliot, 1885: pl. I (figure 38), pl. II (figure 45); redrawn in Schoff, 1912: pp. 244–245. See also Rapson [1908] 1967: pp. lxxxi, lxxxii, 22, 23; Mookerji [1912] 1957: opp. p. 36; Deloche, 1996: p. 205.

182 Schlingloff, 1988: p. 207. See also Wheatley, 1983: p. 271. A "great three-masted vessel" is mentioned in the *Jātaka*, 1895–1913: II: pp. 77–78 (no. 190).

183 Nilakanta Sastri, 1944: p. 26.

184 V. R. Ramachandra Dikshitar (ed. and trans.) 1939: pp. 203–204.

185 Nilakanta Sastri, 1944: pp. 27–28. *Toṇḍi* is unidentified but must have lain in lands to the east colonized by peoples of southern India. This is the general view. However, the editor and translator of the *Śilappadikāram* (*op. cit.*, p. 204 n. 1) believed that "this *Toṇḍi* [not to be confused with Tondi on the south-west coast of India] must have been a great port, belonging to the Cōḷa, or more probably the Pāṇḍyan kingdom." In any event, the items of "tribute" came predominantly, perhaps entirely, from South East Asia.

186 Sarkar, 1969: p. 202.

187 Wheatley, 1983: p. 125 (quoting J. Filliozat).

188 G. Coedès (ed. and trans.) *Textes*, 1910: p. 53 (Ptolemy VII. 2. l); Ptolemaeus, 1932: p. 156.

189 Hultzsch, 1913: pp. 337–339; Nilakanta Sastri, 1949b: pp. 25–30; Coedès, 1968: p. 107. Rajan (1996: p. 103) observed that "[Tamil] vessels used for transoceanic voyages are invariably termed *kalam* or *navay*," both with more than one mast and sail.

190 Nilakanta Sastri, 1932: pp. 314–327; Coedès, 1968: pp. 107, 158.

191 Coedès, 1968: p. 309 n. 74.

192 Wolters, 1967: p. 251; Coedès, 1968: p. 142. See also Basham, 1949: p. 64.

193 Vogel, 1936: p. 91; Coedès, 1968: pp. 109, 141, 158.

194 Hultzsch, 1902–1903: pp. 197–198. Pagān, a dynastic capital until 1298, lies about 90 miles southwest of Mandalay.

195 Wheatley, 1979: p. 295 n. 22.

196 Ray, 1986: p. 202.

197 Heitzmann, 1984: pp. 121, 124, 133; Ray, 1989: pp. 455–456. Cf. the situation in Sri Lanka in Gunawardana, 1979: pp. 339–340.

198 Heitzmann, 1984: p. 124. Heitzmann includes three maps of Buddhist monastic sites in India (3rd century B.C. to ca. A.D. 300) and a map of trade routes, after Schwartzburg *Atlas*, 1978: pp. 19, 24. On the connection between Buddhism and commerce in Japan, see Takekoshi, 1930: 1: pp. 213, 219.

199 Braddell, 1956: p. 4. One sense of the meaning, not a formal title. Literally 'island-maker'. *Dīpa* or *dvīpa* = 'island', a place of safety or refuge to sailors.
200 Wheatley, 1961: p. 189, 1983: p. 272.
201 Majumdar, 1937–1938: pt. 2: pp. 145–154.
202 De Casparis (1961: p. 241) claimed that Amarāvatī buddhas in South East Asia show Sri Lankan influence.
203 On early contacts between Sri Lanka and the Malay peninsula, see Lévi and Chavannes, 1916: p. 49 (eighth century); Paranavitana, 1966: pp. 1–28; for Java, see De Casparis, 1961: pp. 241–248.
204 Coedès, 1968: p. 29. Wolters (1967: p. 63) refers to trade links between North West India and South East Asia in the 3rd century A.D.
205 *Jātaka*, 1895–1913: III: p. 124 (no. 359); see also ibid: IV: pp. 10 (no. 442), 86, 88 (no. 463).
206 Kauṭiliya, 1960–1965: 2: pp. 186–189.
207 *Milinda-Pañho*, 1890–1894: 2: p. 269 (no. 359).
208 Foucher, 1905; Vogel, 1925a: pp. 35–86, 1936; Coomaraswamy, 1965.
209 Bosch, 1924: p. 31.
210 Ray, 1994: p. 191.
211 I-Tsing, 1896: p. xl; Pachow, 1958: p. 20; Coedès, 1968: pp. 81–82.
212 Fa-hsien [1923] 1956: p. 78.
213 I-Tsing, 1896: pp. xxxiv, xli.
214 Mabbett, 1977: p. 156 On *brāhmaṇas* in commerce, see Wheatley, 1983: p. 301; on Hindus generally, Pearson, 1981: p. 120.
215 Walker and Santoso, 1977: pp. 39–45 ("known from Indian archaeology as rouletted fine bowls of Romano-Indian inspiration and dating between A.D. 0–200"); Ardika and Bellwood, 1991: pp. 221–232 (including pp. 229–230, references to other artefactual evidence of Indian trade with South East Asia and indications of possible reverse traffic).
216 To Christie (1979: pp. 285, 287) "an interruption [in land routes]...seem[ed], more than anything else, to have brought South East Asia to the knowledge of the Indian sub-continent and countries to the west." Cf. Adhya, 1966: pp. 175–176.
217 Filliozat, 1970: p. 69.
218 Wolters, 1967: pp. 59–60, 63, and map 2, 1982: p. 35 n. 3 (= Kawang, northwestern Java). Cf. Heine-Geldern, 1947: p. 174, and on *Ko-ying*, see also Wheatley, 1983: p. 259 n. 70.

CHAPTER 3

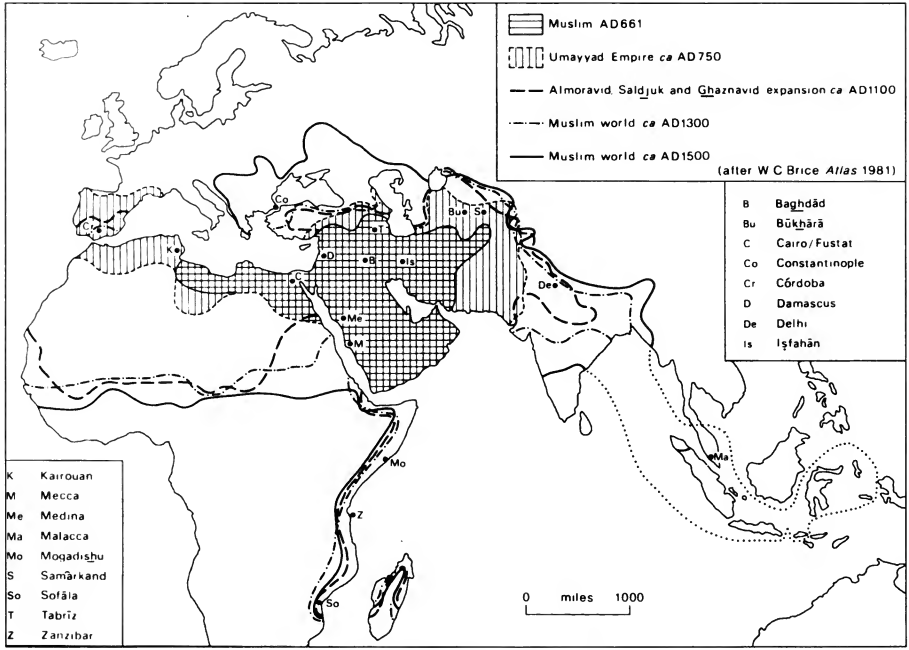
The Arabo-Persian World

Nomenclature

Clove

'Clove' in Arabic is *karanful,* used in the ninth century by al-Kindī in his *Book of the Chemistry of Perfumes*[1] and *Medical Formulary* (*Aqrabādhīn*).[2] Persian has the same or a very similar word[3] and also *mekhaka* (little nails).[4] *Karanful* (and Greek *karyophyllon*) is probably derived from an Indian word, whether Draviḍian (Tamil) or Āryan (Sanskrit). Arab sea merchants must have encountered cloves, nutmegs, and sandalwood in ports along the west coast of India several centuries before they ventured as far as South East Asia. In addition, any one of these products—and first, apparently, cloves—could have reached the Roman Orient over land routes from India by way of Persia and Mesopotamia.[5]

Arab trading activities and the expansion of Islam from the seventh century (Map 5) together account for the wider use of certain aromatics and, specifically, for the presence today of names related to *karanful* in non-Arab parts of western Asia, and in South East Europe and East Africa: Turki and Turkish *karanfil*; Serbo-Croat, *karanfilić*; Albanian, *karajfil hindi*; Gurage (Ethiopic), *quranfud* and Amharic, *qaranfud*; Swahili, *karafuu,* and Hausa, *kanumfari.*[6–12] *Qaranfil* also appears in early modern (ca. 1600) Judeo-Spanish.[13]



MAP 5. The Muslim World, A.D. 661–ca. 1500

Nutmeg

Nutmeg is simply "aromatic or fragrant nut" in the greater part of the Near East: Persian *gawz-i-būyā*,[14] thence Arabic *jauz bawwā*.[15] Presumably, the Arabs became acquainted with the nutmeg through contact with Persian traders. Arabic, however, also has *jauz* [*gawz, djūz*] *aṭ-ṭīb*,[16] with the same general meaning. *Djūz-i-banda* (Banda nut) is recorded from the sixteenth century.[17] None of these can be so easily traced as *karanful* in the Arab diaspora,[18] perhaps another indication of the somewhat later arrival of nutmegs in southern Europe and East Africa.

"The name for mace, *basbāsa*, seems to be a pure Arabic word derived from the root *bassa* 'to break' or 'to crumble'."[19] Ibn Sīnā (980–1037) described both nutmeg and mace as *bisbāsah*.[20] Swahili has *basibasi*, nutmeg (possibly also mace),[21] Turkish *besbāse*, mace,[22] and seventeenth-century Judeo-Spanish *basbāsa*.[23]

Sandalwood

Arabic *ṣandal* and Persian *sandal* are derived from Pahlavi (Middle Persian) *čandal*[24] and this, in turn, from Sanskrit *candana*.[25] White and yellow sandalwood (Persian *sandal-i-safīd*, Arabic *ṣandal abjaḍ*), *Santalum album*, are distinguished from the red, odorless *Pterocarpus santalinus* (*ṣandal ahhmar*). Al-Bīrūnī (973–1051) named four varieties of the former, of which the best was "*maqasīrī*..., heavy, yellow, soft, smooth, and oily and...brought from *Ḍhuhab*. Its odour is sharp and pure."[26] The "most inferior variety" was *waqwāqī*, doubtless from the unidentifiable—perhaps mythical—islands or group of islands of the same name[27] at, or beyond, the limits of Arab seafaring in South East Asia.

Variations on the generic name *ṣandal* in western Asia[28] may antedate the period of Arab expansion. In Europe and East Africa,[29] on the other hand, introductions appear to belong to the seventh century or later. A trader in sandalwood was known as *al-ṣaydanānī*, from the Sanskrit *candani*. The Arabic for 'pharmacy' is *ṣaydanah*, a separate profession from the beginning of the ninth century.[30]

MALŪKŪ AND THE SPICE ISLANDS

Versions of the name Moluccas are found in several European accounts soon after 1500: *Meluza* or *Melucha* by a member of Cabral's Brazil-India expedition (1500–1501)[31] and Amerigo Vespucci's *Maluche* in a letter of 1501 to Lorenzo de Medici concerning the expedition;[32] later, Varthema's *Monoch* (ca. 1510),[33]

Rodrigues's *Malluquo*,[34] Empoli's *Maluc* (1514),[35] Barbosa's *Maluquo* (ca. 1518),[36] and Pigafetta's *Malucque* (1523–1524).[37] Only Pigafetta, a member of Magellan's expedition, and possibly Varthema, actually visited the islands. Barbosa and, earlier, de' Conti (ca. 1440)[38] mention *Bandam* (Banda), which the former associates with the production of nutmeg and mace.[39] *Bandam* is also shown on some early sixteenth-century maps (*supra* pp. 30–31). More or less contemporaneous with these sources, the *Malay Annals* (? 1511–1535) refer to *Moloco* and *Maluku*.[40]

Medieval European travellers, including Marco Polo, say nothing about the Moluccas. The earliest clearly identifiable notice of the name occurs in a Javanese chronicle of ca. 1365: *Maloko* (taken to be Ternate), as well as *Waṇḍan* (Banda) and *Ambwan* (Ambon).[41] Transcriptions of *Maloko* have been identified in Chinese reports from at least the fourteenth century: *Mi-lo-chü* (with cloves);[42] also *Wên-tan* (with nutmegs and mace), Banda.[43]

The first unequivocal Arab references to the Moluccas (*Malūkū*) are in navigational texts of the second half of the fifteenth century (ca. 1460) and the early sixteenth century (ca. 1510).[44] In the words of Sulaimān al-Mahri: "East of Timor [where sandalwood is found] are the islands of *Bandam* and they are the islands where nutmeg and mace are found. The islands of cloves are called *Malūkū*...."

There was a long tradition of Spice Islands to the east of known parts of the Indonesian archipelago. One of the earliest and most reliable of Arab geographers, Ibn Khurdādhbeh (ca. 850), wrote of a "land [islands] where the spices grow," a (notional) 15 days voyage to the east of *Salāhiṭ*,[45] on or near what later became known as the Strait of Malacca. The *Mukhtaṣar al-'Aja'ib* (ca. 1000) has: "The Island of Perfume [*Jazīrat al-Ṭīb*] is 15 days from the...islands [of *Salāhiṭ*, *Jāba*, and *Harang*]. It produces all sorts of spices."[46]

The Persian Marvazī (ca. 1120) refers to islands where cloves were obtained by 'silent trading.'[47] The informants were apparently Indonesians who traded directly with the Moluccas. There is no evidence that Arab or Persian merchants visited the Spice Islands in advance of the first Europeans. Ibn Baṭṭūṭa (ca. 1350) says that clove trees were found "more...in infidel than in Muslim country,"[48] suggesting that they lay near or beyond the eastern margins of Islamic influence and of direct Arab knowledge. For the rest, however, the account belies his claim that he had "seen all this and been witness to it."

> The clove trees are of great age and huge....What is brought to our country is the wood. What people in our country call 'the flower of the clove' is what falls from the flowers. The fruit of the clove is the nutmeg, known to us as the perfume nut. The flower that is formed within it is mace.[49]

Even in the middle of the sixteenth century, Sidi Ali Çelebi, who translated into Turkish and embroidered the work of Sulaimān al-Mahrī,[50] relayed the view that the Islands of Cloves were "difficult of access, no one goes there," and then proceeded to give a completely erroneous account of how cloves were collected.[51]

SUPPLY OF MOLUCCAN SPICES

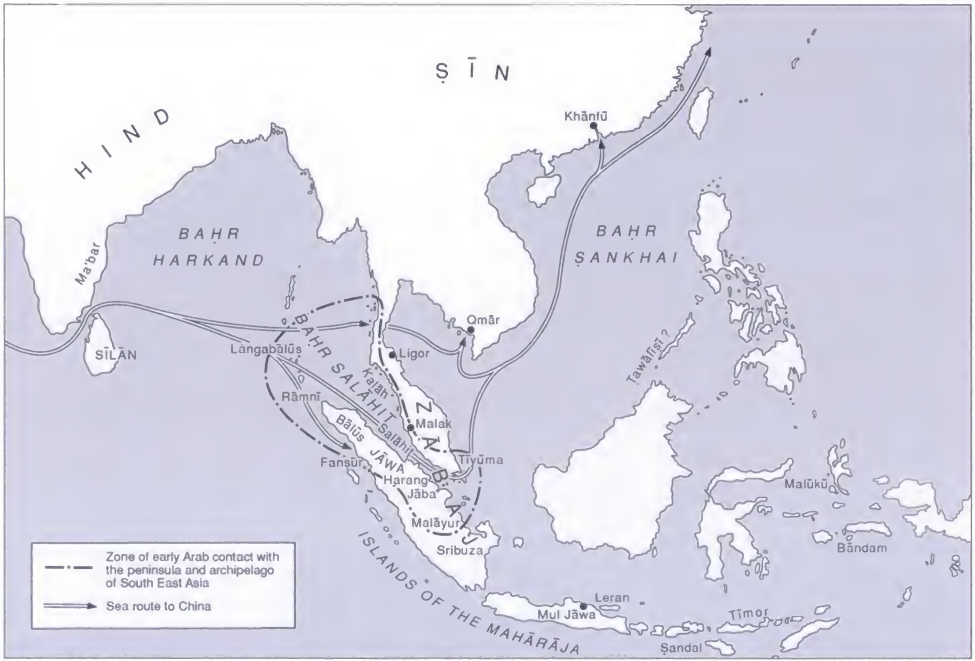
Arab and Persian merchants bought Moluccan products in western Indonesia. Many were on their way to China, which was reached by the late seventh century. Few, if any, so far as we know, left an account of the voyage. We depend therefore on compilations, based on lost originals or verbal reports, borrowed, amended, combined, and doubtless often incorrectly transcribed or transmitted. Some, but by no means all, of these compilers also were travellers, chiefly in western Asia, more rarely India, and more rarely still East Africa; never, with the sole exception of Ibn Baṭṭūṭa, beyond the Bay of Bengal. Consequently, our knowledge of Arab trading in South East Asia must always be imperfect—just how imperfect we are never likely to know. Even the identification of place names often poses formidable problems.

Many lands or islands in Arabic accounts of South East Asia cannot now be satisfactorily identified. Some may have been partly or wholly fictitious, of which at least three are said to have produced cloves. This in itself is a reflection of their value and of the air of mystery surrounding their place of origin.

The island of *Barṭāyil* or *Kāsil*, "belonging to the Mahārāja," lay broadly within Indonesia. Garbled accounts of silent and invisible barter for cloves on *Barṭāyil* go back to the ninth century, and were repeated until at least the fourteenth century.[52-53] There is, however, nothing to show that Arabs were involved in such transactions, rather the reverse.

Malāi, with both cloves and nutmeg, appears only in al-Idrīsī's *Geography* (ca. 1154).[54] It does not correspond either to *Malaya* or to *Malāyu[r]* in southern Sumatra. Idrīsī says that it was a synonym for *Qumr* (Madagascar), which is inexplicable. Third, the island of *Ṣankhai* that, according to al-Dimashḳī (ca. 1325), had cloves, nutmeg and sandalwood,[55] also lay somewhere in the empire of the Mahārāja. Curiously, *Ṣankhai* resembles a Moluccan name for clove, *chauque* or *chanque*,[56] Malay *chĕngkeh* from the Chinese *chi-shê-hsiang*.[57] *Ṣankhai* originally referred to the South China Seas (*Baḥr Ṣankhai*).

Reports from the tenth century onward agree that Moluccan aromatics were readily obtainable in the "Islands—or Empire—of the Mahārāja,"[58] what the Arabs often called *Zābaj*,[59] that is chiefly Sumatra (*Jāwa*) and the southern part of the Malay peninsula (Map 6). Abū Zaid (916) tells us that the Mahārāja was



MAP 6. The Arabs and South East Asia.

a former king of *Zābaj*.[60] Doubtless the boundaries of both regions, whether or not they coincided, were indefinite and changed over time. Al-Mas'ūdī (ca. 956) claimed that the empire exported (evidently re-exported) clove, nutmeg, and sandalwood. The heartland of *Zābaj* and of the Arab zone of contact with South East Asia lay along and around the *Baḥr Salāhiṭ* (Strait of Malacca), especially the comparatively narrow southern passage, on the shortest all-sea route to China from the Bay of Bengal.

On the Sumatran side of the narrows lay the island or territory (? and port) of *Salāhiṭ* or *Salāhaṭ* (Malay *sĕlat* = 'strait'). *Salāhiṭ* is mentioned earliest and most often as having cloves and sandalwood,[61] but not apparently nutmeg or mace. Sindbād on his third voyage found sandalwood "in abundance."[62] The kingdom of *Jāba* lay adjacent to *Salāhiṭ*. The anonymous Persian geography *Ḥudūd al-'Ālam* (982) treats them as a single island, where again cloves and sandalwood were to be found.[63] According to the *Mukhtaṣar al-'Ajā'ib* (ca. 1000), "the island of *Jāba* contain[ed] the town of *Salāhiṭ* [and] produce[d] sandal and cloves" among other tropical products.[64] These statements evidently involve a good deal of uncritical copying.

From the northern entrance to the Straits, there are two relevant notices. Sandalwood could be obtained at the entrepôt of *Kalāh* on the west coast of Malaya.[65] At *Rāmnī* (*Rāmini*) in northern Sumatra, "some of [the] kings possess[ed] exquisite scents such as sandal and mace, but no one [was] allowed them except the king in question,"[66] which suggests imported luxuries, although al-Dimashḳī later claimed that the clove tree grew there.[67] Just beyond the southern end of the Strait, on the sea lane to China, lies the island of Tiyūma, and here, on the evidence of Idrīsī (ca. 1154), sandalwood was available and possibly grown.[68] The *Mukhtaṣar al-'Ajā'ib* (ca. 1000) extends the distribution to *Qmār*[69] on the lower Mekong (Cambodia). Some of these references may have been to red sandalwood (*Pterocarpus* spp.),[70] but it is also possible that *Santalum album* already had been widely introduced in South East Asia, from a center in and around Timor, just as it had apparently been taken to southern India at an early date.

Waṣṣāf (ca. 1300) and Ibn Baṭṭūṭa (ca. 1350) both mention cloves in *Mūl Jāwa* (Java),[71] but these should be regarded as imports and re-exports, rather than introductions. Although Java lay far from the most direct route to China, the presence of Islam by the beginning of the twelfth century is shown by an inscription at Leran.[72]

In the days of the Abbāsid Caliphs (750–1258), the leading entrepôts in the Arabo-Persian world for the products of "India and China" were Alexandria-Damietta, Aden, and Sīrāf on the Persian Gulf.[73] Merchants arriving in Aden from India in 976 paid "contributions of musk, camphor, ambergris and san-

dalwood" (all aromatics) to the Yemeni Sultān, Ibn Ziyād.[74] Cloves, nutmegs and mace appear in price lists drawn up in Aden (1198), Palermo (mid-eleventh century), and al-Mahdiyya in Tunisia (ca. 1063).[75] Cloves and 'broken cloves' (*siyāla*) are named among eastern spices (*buyār*) at Alexandria in the *Minhādj* of al-Makhzūmī (twelfth–thirteenth centuries).[76] The cities of west-central Asia were supplied from the Levant or India, rarely from China. González de Clavijo (1403–1406) claimed that the court of Timur (Tamerlane) at Samarkand got "from India...the lesser spiceries, which indeed are the most costly of the kind, such as nutmegs and cloves and mace...that are never to be found in the markets of Alexandria"[77]—a rider that was patently untrue.

Moluccan products shipped by Arabs to markets in the Near East must customarily have passed through the ports of India or Sri Lanka. Some were doubtless landed and sold there. It could therefore easily be assumed by importers in western Asia and southern Europe that they originated in India, although India often stood for the East generally in the minds of some early authors. Ibn Khurdādhbeh (ca. 850) tells us that India exported cloves, nutmegs and sandalwood,[78] al-Ghāfiqī (ca. 1150), quoting Ishak b. 'Imrān (d. 907), that nutmegs were imported from India.[79] Al-Ḳalḳashandī in the fourteenth century thought that India had both the clove tree (*qaranful*) and mace (*basbāsa*).[80] Several medieval Indian works imply that cloves grew in southern India (*supra* p. 52).

After reaching India or Sri Lanka, the products of the Far East were sometimes shipped to East Africa (*Zanj*), particularly the port of Sofāla, which gave scope for further misunderstanding.[81] Ibn Māsawaih (ca. 850), in his treatise on *Simple Aromatic Substances*, states that cloves, nutmegs, and sandalwood, all "secondary aromatics," were brought (along with cubeb, Indian pepper, and cardamom) from Sofāla.[82] This was in part repeated by al-Ya'ḳūbī (889)[83] and al-Bīrūnī (ca. 1030).[84] When Europeans first arrived in Mozambique and Calicut at the close of the fifteenth century they found Arab merchants trading in cloves.[85] On the coast of East Africa, cloves (*karafuu maiti*) and camphor (*kafuri maiti*) are, or were until recently, used in burial rites. In the middle of the fourteenth century, the former were among the preferred "articles of perfumery" in *Mālī* (Mali), West Africa.[86]

Sri Lanka and Sumatra were often confused in the classical and medieval literature. Under *Sarandīb*, the author of the *Ḥudūd al-'Ālam* (982) appears to have conflated their products: pearls, cloves, nutmegs (*jauz-i bavā*), cardamom (*ḳāḳula*), and "all kinds of spices (*afvāh*)."[87] Al-Bīrūnī (ca. 1030) was led astray by similarity of names: writing of Sri Lanka (Skr. *Lanka*), he says that cloves, *lawang* (Skr. *lavaṅga*), were imported from *Laṅga* (*Laṅgabālūs*, the Nicobar

Islands).[88] According to Ḳazwīnī (ca. 1280), *Sīlān*, "lying between India and China," drew upon both for aromatics, including cloves and sandalwood.[89]

USE OF MOLUCCAN SPICES

What proportion of Moluccan products was used in the Arab or wider Islamic world, rather than taken on to China, landed in India on the return voyage, or traded to the West by way of the Levant, we have no means of knowing. Spicy aromas were part of some cures and many culinary preparations were thought to serve medicinal ends. Both nutmegs and cloves helped the digestion and were recommended for stomach disorders generally.[90] Ibn Māsawaih (ca. 850) observed that cloves were used in "the cooking of nutmeg," and nutmeg in the cooking of the *bān* (ben-nut, seed of *Moringa pterygosperma*).[91] The connection between food and physical well-being, the psychological benefits of particular aromas, and the need to remove or mask unpleasant odors were fully appreciated by those who were in a position to buy any significant quantity of Eastern spices.

Aromata

Ibn Māsawaih placed clove, nutmeg, and sandalwood among selected secondary aromatics (*afāwih*). The primary group (*uṣūl*) of five included one other Indonesian product, camphor.[92] The Moluccan species all appear in the *Book of the Chemistry of Perfumes* (ca. 870) by al-Kindī or one of his pupils.[93] They must have been available by the eighth century and probably much earlier, certainly before the first firmly dated Arab or Persian voyages to the Far East.

Nutmeg was "introduced into liquid aromatics for women," and also "brought in its original shape and used in ornamental neckbands,"[94] doubtless on account of the pleasing scent, which was remarked by Ibn Sīnā (ca. 1030).[95] The nut was sometimes combined with (or not distinguished from) mace in preparing perfumes.[96] Al-Bīrūnī (ca. 1050) rather surprisingly placed *jauz buwwā* "among the superior fragrances...employed more than any other ingredient in perfumes and scents,"[97] which must be an exaggeration. 'Abd ar-Razzāḳ of Algeria (*? ca.* 1720) remarked that nutmeg was both a perfume and a deodorant.[98]

Early Arab authorities agree on the distinctive and penetrating aroma of cloves.[99] Al-Yaʿḳūbī (889) described it as a "breath of Paradise,"[100] reaffirming an association that has included several other aromatics. 'Ali aṭ-Ṭabarī (b. ca. 810), author of *Paradise of Wisdom* (the first Arabic treatise with a section on Indian medicine) states that cloves were used in incense and like sandal-

wood in "perfumed fumigation."[101] Clove wood was burnt as a fumigant.[102] People from China to western Europe disguised halitosis by chewing cloves or nutmeg,[103] and both products were added to dentrifices.[104] Ibn al'Awwām (ca. 1150) scented rose water with cloves or sandalwood or camphor.[105] Moroccans until recently added cloves to milk.[106]

In the time of al-Bīrūnī (ca. 1050), "artificial cloves [were] often made from gum-tragacanth and the rind of cloves, sieving this mixture."[107] Elaborate methods of testing cloves (and other spices) to determine quality and so prevent adulteration and outright fraud, were devised.[108] At the same time, much attention was given to finding effective substitutes,[109] especially as materia medica, when particular products were unavailable or prohibitively costly. In place of *karanful,* twice the weight of clove peel or three times the weight of basil was recommended, all according to Ibn Māsawaih as quoted by al-Bīrūnī.[110] Other species of *Myristica* were widely used to adulterate or to serve as substitutes for Banda nutmeg and mace (*M. fragrans*).

In the *Book of the Thousand Nights and a Night,* Abū al-Husn's slave girl Tawaddud was "scented, with sandal and musk."[111] Sandalwood as powder or paste was borrowed from India. Ibn Māsawaih knew several kinds and the nature and strength of their aromas.[112] Al-Kindī[113] in the ninth century and, over 700 years later, Abū'l Fazl-i- 'Allāmī[114] in Mughul India used sandalwood in the preparation of many perfumes. Like clove and nutmeg, it was an ingredient in tooth powder and recommended for oral hygiene.[115] The Jewish physician Moses Maimonides (1135–1204), who practiced in Cairo, advised in a treatise on asthma that sandalwood should be placed on the fire and "the resultant vapours inhaled."[116] Burning sandalwood also was believed to be an effective fumigant,[117] particularly at times of epidemic disease, such as the Black Death in Aleppo in 1349.[118] In Persia, according to the poet Firdausī (ca. 940–ca. 1020), pieces or granules of sandalwood were placed in shrouds.[119]

Materia Medica

Arab medical practice was grounded in several earlier traditions: Mesopotamian, Greek, Alexandrian, Persian, Syrian, and Indian. The particular Arab contribution lay in the field of pharmacology,[120] where commercial contacts with China and South East Asia, as well as with India, proved to be highly significant.

Before and for several centuries after the rise of Islam, Jewish and Christian (Nestorian) Arab practitioners were prominent in the Near East. The leading pre-Islamic centers of medical learning were Alexandria, Antioch, Constantinople, Nestorian Edessa, and, most important here, Gondēshapūr[121] in

Khūzestān (southwestern Persia, Map 8). Gondēshapūr between about the fifth and the ninth centuries was the most cosmopolitan of centers, bringing together Western and Indian approaches to healing and the materia medica associated with each. India was recognized as particularly rich in drugs,[122] and it was probably through Gondēshapūr and from an Indian bridgehead that Moluccan medicines first reached the Arabo-Persian and Byzantine worlds. The city was taken by the Arabs in 638, but it was long after the selection of Baghdād as the capital of the Caliphate in 762 that the influence of the medical school began to wane. The Christian Arab Ibn Māsawaih (d. 857) was the last great physician of Gondēshapūr and one of the earliest and most eminent of Arab pharmacologists. His *Simple Aromatic Substances*[123] shows that he was remarkably well informed about South East Asian products, including all the Moluccan spices, as well as camphor from Sumatra or Borneo.

Other leading physicians who used or referred to cloves, nutmeg, and sandalwood between the ninth and the eleventh centuries also worked in Mesopotamia (notably Baghdād) or Persia-Afghanistān (Iṣfahān, Tehran, Herāt, Ghazni): celebrated masters such as al-Kindī, Muwaffaq ibn 'Alī (Abū Manṣūr), al-Rāzī (Rhazes), Ibn Sīnā (Avicenna), and al-Bīrūnī. The first Arab alchemist of note, Jābir ibn Ḥayyān (ca. 721–776)[124] lived in Baghdād and al-Kufa, 90 miles to the south of the capital.

In the eleventh and twelfth centuries, centers of medical instruction (and sources of information) began to shift to Muslim Spain (Córdoba) and Sicily (Palermo) and to North Africa, from Morocco (Tetuán) and Tunisia (Kairouān) to Cairo. Al-Idrīsī, who studied in Córdoba and worked in Sicily under the patronage of Roger II, wrote a *Collection of Simple Drugs*[125] in addition to his more famous *Geography*. Ibn al-Baiṭār (d. 1248), the most learned and prolific Arab botanist and pharmacologist, spent most of his life in Spain, although he died in Damascus.[126]

Jewish pharmacists and physicians were prominent in cities throughout North Africa and the Near East.[127] Moses Maimonides[128] was born in Córdoba (1135) but moved to Fez (1160–1165) and then to Cairo (1165–1204) after the city came under the rule of the Almohades. Jewish participation in the trade of Cairo at this time is exemplified in documents from the *Geniza*. Merchants of al-Fustāt (Old Cairo) visited India or had agents there. They specialized in perfumes—many lived around the Square of the Perfumers[129]—and in pharmaceutical products,[130] both genuinely Indian and South East Asian. Apparently few penetrated as far as Indonesia.[131] Judeo-Arabic letters of the eleventh and twelfth centuries mention nutmegs and nutmeg paste, and cleaned cloves, stalks and bark, all in transit. When, in May 967, a Kairouān merchant in Old Cairo obtained a loan of 600 pieces of *nuqra* silver, the creditor accepted as

security twelve *mann* (about 24 pounds) of nutmeg, a convincing illustration of the value of the spice.[132]

The Moluccan spices appear in prescriptions in Prospero Alpini's account of Egyptian medicine in the late sixteenth century,[133] and in Peter Forskål's *Materia Medica Kahirina*, published posthumously in 1775.[134] They were still displayed in the drug markets and pharmacies of Cairo in the early part of the twentieth century.[135] Likewise, early eighteenth-century *materia medicas* from the Maghrib list all three products.[136]

Over many centuries, cloves, nutmeg-mace, and white sandalwood were prescribed, either alone (simples) or more commonly in combination with other substances, for a great variety of maladies: cloves and nutmeg for respiratory and digestive conditions; nutmeg "to strengthen the liver and the spleen;" pulverized cloves "to strengthen the brain;" cloves, nutmeg, and sandalwood as cardiacas; cloves and nutmeg in collyriums (eye salve); oil of clove and nutmeg in embrocations for rheumatism and muscular disorders, and for toothache; cloves and nutmeg as a tonic or stimulant, in electuaries and confections.

Red sandalwood, we are told by al-Bīrūnī, was "used only [in medicine] in external applications and in applique work...[it is] rubbed on a rough stone and applied [to] hot inflamations."[137] Like white sandalwood, and perhaps originally as a substitute, it had a reputation as a cooling agent. Probably very few of these remedies were original. Some can certainly be traced to India. Many, in due course, were passed on to the West, where one or two—notably clove oil for toothache—have survived to the present day.

Notes

1 Al-Kindī [d. ca. 873] (ed. and trans. [German] K. Garbers) 1948: p. 297 [90]. On the authorship of these recipes to fabricate natural perfumes, see Dunlop, 1971: pp. 229–231.

2 Al-Kindī (ed. and trans. M. Levey) 1966: p. 315 [231]. See also al-Bīrūnī [973–1051] *Pharmacy and Materia Medica* (ed. and trans. H. M. Said and R. E. Elahie) 1973: 1: p. 265 (*qaranful*); Ibn Sarābī [first half of twelfth century] in Guigues, 1905: p. 502 [104], and *De Simplicibus*, 1531: pp. 209–210 [CCCIX]; Ibn al-Baiṭār [d. 1248] (trans. L. Leclerc) 1877–1883: no. 1748 (*qarenfol*).

3 Muwaffaq ibn 'Alī [Abū Manṣūr] of Herāt [ca. 975] (trans. and comment. Abdul-Chalig Achundow) [1893] 1968: p. 457 (*qaranful*). *Calafur* in some sixteenth–seventeenth century European accounts—Do Couto [ca. 1600] in Barros and Do Couto, 1777–1788: Dec. IV(2), liv. vii, cap. ix (p. 175); Olearius [1639] 1727: 2: p. 426.

4 Nadkarni, 1976: 1: p. 835. Cf. Ainsley, 1826: 1: p. 75 (*mykhék*); Yule and Burnell *Hobson-Jobson* [1886] 1985: p. 223. Levey (1962: pp. 15, 48 n. 323) has *khirī*, clove or a type of clove used in the preparation of Indian ink (Ibn Bādīs, ca. 1025).

5 The discovery of "vessels contain[ing] some cloves" at Terqa (Middle Euphrates), dated 1750–1600 B.C., was reported by G. and M. K. Buccellati (1983: p. 54), quoting K. Galvin "The Botanical Remains" *Syro-Mesopotamian Studies* (forthcoming). I have failed to locate the latter contribution (in *S.M.S.* or elsewhere) or to make contact by letter (10. vii. 99) with Prof. G. Buccellati. Likewise inquiries among assyriologists in Cambridge and Chicago have shed no light on this astonishing claim, which L. Y. Andaya (1993a: p. 2) appears to accept. J. Reade (1996: p. 15) called for "further substantiation."

6 Raquette, 1927: p. 19; Fahir İz and Hony, 1992: p. 95.

7 Benson, 1990: p. 132. Cf. Slovak *korenie*, spices (Simko, 1968: p. 166).

8 Mann, 1957: p. 63 (also *gozhdē* [nail] *hindi*).

9 Leslau, 1979: 2: pp. 128–129.

10 Leslau, 1976: p. 297; Walker, n.d. [1928]: p. 32 (*qurunfūd*).

11 Johnson, 1939: 1: p. 73 (clove tree, *mkarafuu*); Snoxall, 1958: p. 44 (clove stalk, *kikonyo*).

12 Bargery, 1934: p. 1166.

13 Crews, 1967: pp. 252–253 (also *qlabo*).

14 Muwaffaq ibn 'Alī [Abū Manṣūr, ca. 975] 1968: p. 179 (*dschûz-i buwwâ*); Maimonides [twelfth century] (ed. and trans. M. Meyerhof) 1940: pp. 38–39; Guigues [Ibn Sarābī] 1905a: p. 499 [83]; Schlimmer, 1874: p. 402.

15 Al-Ghāfiqī [d. ca. 1160] (ed. and trans. M. Meyerhof and G. P. Sobhy) 1932–1938: 2: pp. 368–370 (*gawz buwā*, from Persian *gawz-i-būyā*); al-Bīrūnī [973–1051] 1973: pp. 114 [37] (*jauz buwwā*), 117 [60] ("probably derived from *gauz-būyā*"); Ibn Māsawaih [d. 857] in Levey, 1961: p. 404 n. 63 (from *gawz-i-buya*).

16 Ibn al-Baiṭār [ca. 1197–1248] 1877–1883: 1: pp. 378–379 (and in Ferrand, 1913–1914: 1: p. 256). See also Schweinfurth, 1912: p. 31 (*gōs-ett-ttīb*); Meyerhof, 1918: p. 198 [314] (*gôz tîb*).

17 Orta [1563] (ed. Conde de Ficalho, trans. C. E. Markham) 1913: p. 275 (*jauzibam*); Diego do Couto in Ferrand, 1913–1914: 1: p. 2 (*geauzibanda* = *djuz-i-banda*).

18 Note, however, Syriac *kozī būyā* in al-Bīrūnī, 1973: p. 114 [37]. Meyerhof and Sobhy in al-Ghāfiqī (1932–1938: 2: p. 369) have Syriac *gôzê de-besmâ*, after al-Bīrūnī.

19 Meyerhof and Sobhy in al-Ghāfiqī, 1932–1938: 2: p. 369. Ibn al-Baiṭār (1877–1883: pp. 222–223 [no. 281]) wrongly associated *besbâssa* with Greek and Latin *macer, macir,* quoting Dioscuridēs. Also *besbessa* ('Abd ar-Razzāk, trans. L. Leclerc, 1874: p. 55 [131]), *bisbese* (Ibn Sarābī [12th century], in Guigues, 1905 a: p. 499 [83]), *bissbāss* (Schweinfurth, 1912: p. 31), *bazabaza* (Nadkarni, 1976: 1: p. 830), *bisbāsah* (Graziani [Ibn Jazlah, eleventh century] 1980: p. 198. "The name *bisbāsa* or *bisbās* in Spain designated (in the past) and today in Morocco designates the fennel" (Maimonides, ed. M. Meyerhof, trans. F. Rosner, 1979: p. 29). Cf. M. Levey, 1961: p. 404 (Ibn Māsawaih associates nutmeg and fennel: "They are equal as aromatics except in a minor way.")

20 Said and Elahie in al-Bīrūnī, 1973: 1: p. 117 [60].

21 Johnson, 1939: 1: p. 370.

22 Redhouse, 1890: 1: p. 364a.

23 Crews, 1967: p. 234.

24 MacKenzie, 1971: p. 21. Laufer (1916: p. 470 [90], 1919: pp. 552, 554) gives Persian *čandān* and *čandal.* Abū'l-Fazl [1595] (in Ferrand, 1913–1914: 2: p. 547) has "le bois de sandal est appelé dans l'Inde *čandan*."

25 "The Arabs, as persons who have a scent for the commerce of [the lands about Malacca], corrupt the word and call it *ṣandal;* and all the Moors [Muslims] of whatever nation call it so" (Orta [1563] 1913: pp. 393–394).

26 Al-Bīrūnī, 1973: 1: p. 207 (and in Ferrand, 1913–1914: 2: p. 547); *maqáçar* in Abū'l Fazl-i-'Allāmī (ed. and trans. H. Blochmann) 1873: p. 81. On the origin of the name, see Ferrand, *op. cit:* pp. 617–618 n. 8.

27 See Tibbetts (1979: pp. 161–177) for a summary of reports.

28 Armenian *čandan* (Laufer, 1919: p. 552); Turki *ṣändāl* (Raquette, 1927: p. 102); Turkish *sandal ağaçi, sandalhoz* (Vahid, 1924: p. 492, Fahir İz and Hony, 1992: p. 422).

29 Swahili *sandali* (Johnson, 1939: 1: p. 476).

30 Hamarneh, 1972: pp. 7, 47. According to Hamarneh, al-Bīrūnī "confirmed" that *ṣaydanānī* came from *chandanani.* See also Goitein, 1967–1983: 2: p. 261 (pharmacist, apothecary = *ṣaydalānī* and *ṣaydanī*).

31 Cabral (ed. and trans. W. B. Greenlee) 1938: p. 93 ("places whence spices come," concluding the *Anonymous Narrative*). King Manuel's letter of 1499 to the King and Queen of Castile, announcing the return to Portugal of part of Vasco da Gama's fleet (bringing cloves and nutmegs, obtained in Calicut), mentions Malacca, but not the Moluccas (Vasco da Gama, ed. and trans. E. G. Ravenstein, 1898: pp. 113–114).

32 Baldelli-Boni, 1827: 1: p. lviii; also printed in Cabral, 1938: p. 160. Vespucci, on his way out to Brazil, met vessels of Cabral's returning fleet at

Beseguiche, a harbor near Dakar, Cape Verde. *Moluche* in the *Ricettario Fiorentino* (1597: pp. 41, 53), but not mentioned in the earliest edition, 1498 (facs. 1968).

33 Varthema (ed. G. P. Badger, trans. J. Winter) 1863: pp. xcii, 245.

34 Pires [and Rodrigues] (ed. and trans. A. Cortesão) 1944: 1: p. 208 (reproduced here as Figure 10).

35 Empoli, 1846: p. 81.

36 Barbosa (ed. and trans. M. Longworth Dames) 1918–1921: 2: p. 198.

37 Pigafetta, facs., 1963: here Figure 1.

38 Conti (ed. R. H. Major, trans. J. Winter Jones) 1857: p. 17.

39 Barbosa, 1918–1921: 2: p. 197.

40 J. Leyden (trans.) 1821: pp. 21, 231.

41 T. G. Pigeaud (ed. and trans.) 1960–1963: 2: p. 17, 4: p. 34. On *Malūkū*, see Andaya, 1993a: p. 47.

42 Hirth and Rockhill in Chau Ju-kua [1225] 1911: p. 83; Rockhill, 1915: pp. 259–260 (A.D. 1349); Ferrand, 1919: pp. 279–282; Ptak, 1992: p. 29.

43 Rockhill, 1915: pp. 256–257 (A.D. 1349).

44 Tibbetts, 1979: pp. 14–15, 189–225, 232 ("[The] islands from Borneo eastward are really appearing in Arabic literature for the first time."). Yāḳūt (ca. 1224) mentions the "land of *Malak*"; from the context, this would appear to be Malacca rather than the Moluccas (Ferrand, 1913–1914: 1: p. 208; cf. Tibbetts, 1979: pp. 90–91, 114—"Yāḳūt could be using the term *Jāwa* [Sumatra] and *Malak* to represent both sides of the Strait of Malacca.") Ibn Baṭṭūṭa's *Tawālisī* [ca. 1350] (1994: p. 884) has been identified as Tawal Island in the Moluccas, but, notwithstanding some support from Ibn Mājid, ca. 1460 (Tibbetts, 1979: p. 98), this is generally thought to be very unlikely.

45 Tibbetts, 1957: pp. 18, 33–36, 1979: pp. 71 ("the only reference amongst the early geographers to islands any distance east of the Malay Peninsula and Sumatra"), 179–182.

46 Tibbetts (trans.) 1979: p. 180. According to Tibbetts, the *Mukhtaṣar* was compiled from the Book of the Wonders of India (*'Ajā'ib al-Hind*) of Buzurg b. Shahriyār and the works of al-Mas'ūdī. It also has been attributed to Ibn Wāṣif Shāh—Ferrand (trans.) 1913–1914: 1: pp. 137–160 (*L'Abrégé des Merveilles vers l'an 1000*).

47 Marvasī (ed. and trans. V. Minorsky) 1942: pp. 58–59. Minorsky describes the island as the Clove Mine. See Tibbetts, 1979: pp. 180–181.

48 Ibn Baṭṭūṭa (ed. C. Defrémery and B. R. Sanguinetti, trans. H. A. R. Gibb and C. F. Beckingham) IV: 1994: p. 882.

49 Ibid. It is unclear why Tibbetts (1979: pp. 98–99) thought that Ibn Baṭṭūṭa "explain[ed] the clove fairly accurately." He was equally ill-informed con-

cerning the nature and production of camphor (Donkin, 1999: pp. 45, 118, 122.)

50 M. Bittner (ed. and trans.) *Muḥīṭ* [The Ocean] (1553–1554), 1897; Ferrand, 1913–1914: 2: pp. 484–541 (French, from the English translation by Joseph von Hammer-Purgstall, 1834: pp. 545–553, 1836: pp. 441–468, 1837: pp. 805–812).

51 Ferrand, 1913–1914: 2: p. 513; Tibbetts, 1979: p. 180.

52 Ibn Khurdādhbeh (ed. and trans. G. Barbier de Meynard) 1865: p. 293; Ferrand (trans.) 1913–1914: 1: p. 29; Tibbetts (trans.) 1979: p. 29.

53 *Mukhtaṣar al-'Ajā'ib* [ca. 1000] in Tibbetts (trans.) 1979: p. 177, Ferrand (trans.) 1913–1914: 2: p.144 ; al-Ḳazwīnī [1203–1283] (trans. [German] H. Ethé) 1868: pp. 227–228 (quoting Ibn al-Faḳīh, ca. 902), and in Ferrand (trans.) 1913–1914: 2: pp. 304–305. Flückiger and Hanbury (1879: p. 503) appear to assume that Ḳazwīnī's *Barṭāyil* = the Moluccas. Ibn al-Wardī (ca. 1340) in Ferrand (trans.) 1913–1914: 2: p. 423. Bīrūnī [ca. 1030] (Ferrand, 1913–1914: 1: pp. 165–166) has a version of the report involving either *Laṅkā* (*Sīlān*, Sri Lanka) or *Laṅga* [*-Bālūs*] (the Nicobars); Marvasī [ca. 1120] (1942: pp. 58–59) referred to "the nearer islands belonging to India."

54 Al-Idrīsī (ed. and trans. A. Jaubert) 1836–1840: 1: p. 93; also Ferrand (trans.) 1913–1914: 1: p. 193, Tibbetts (trans.) 1979: p. 86.

55 Dimashḳī (ed. and trans. A. F. Mehren) 1874: p. 206 (*çendji*); Ferrand (trans.) 1913–1914: 2: p. 381.

56 Orta (1563) 1913: p. 215.

57 Li, 1979: p. 87 (later *ting-hsiang*).

58 Al-Mas'ūdī [943] (trans. A. Sprenger) 1841: p. 355, (trans. C. Barbier de Meynard and P. de Courteille) 1861–1877: 1: p. 341, 3: p. 56, (trans B. Carra de Vaux) 1896: p. 91. In Ferrand (trans.) 1913–1914: 1: pp. 99, 110, 154, and Tibbetts (trans.) 1979: p. 38, and cf. p. 105 (*Zābaj*). *Mukhtaṣar al-'Ajā'ib* (ca. 1000), in Ferrand (trans.) 1913–1914: 1: pp. 144, 154 (clove, nutmeg, mace, sandalwood). Idrīsī (1154) 1836–1840: 1: p. 89, and in Ferrand (trans.) 1913–1914: 1: p. 191.

59 Ibn al-Faḳīh (902) in Ferrand (trans.) 1913–1914: 1: p. 65 (*Djāwaga*, clove, nutmeg, sandalwood), Tibbetts (trans.) 1979: p. 106 (*Zābaj*). Yāḳūt (1179–1229) in Ferrand (trans.) 1913–1914: 1: p. 208 (*Djāwa*), Tibbetts (trans.) 1979: p. 55 (*Jāwa*). Ḳazwīnī (1203–1283) in Ferrand (trans.) 1913–1914: 2: p. 309 (*Djāwa*, exports cloves, mace); Ibn Baṭṭūṭa (ca. 1350) 1994: pp. 876 (*al-Jāwa*, cloves), 880.

60 Tibbetts (trans.) 1979: p. 33.

61 Ibn Khurdādhbeh (ca. 850) 1865: p. 288 (and in Ferrand, 1913–1914: 1: p. 28, Tibbetts, 1979: p. 29); Anon. *Ḥudūd al-'Ālam* [982] (ed. and trans.

V. Minorsky) 1937: p. 57; al-Bīrūnī (973–1051) 1973: 1: p. 207 (*Jāwah*); al-Idrīsī (ca. 1154) 1836–1840: 1: p. 82 (and in Ferrand, 1913–1914: 1: p. 186); Ḳazwīnī (1203–1283) in Ferrand, 1913–1914: 2: p. 312, Tibbetts, 1979: p. 57 (exports sandalwood); Ibn al-Wardī (ca. 1340), in Ferrand, 1913–1914: 2: p. 422 (exports sandalwood).

62 L. Langlès (ed. and trans.) 1814: p. 48; R. Burton (ed. and trans.) 1894: p. 370. In Tibbetts (trans.) 1979: p. 42.

63 Anon. (ed. and trans. V. Minorsky) 1937: p. 57.

64 Ferrand (trans.) 1913–1914: 1: p. 152 (*Djāba*), Tibbetts (trans.) 1979: p. 49.

65 Sulaimān/Abū Zaid [ca. 916] (ed. and trans. J. Th. Reinaud) 1845: 1: p. 93, and in Ferrand (trans.) 1913–1914: 1: p. 83, Tibbetts (trans.) 1979: p. 33. *Mukhtaṣar al- 'Ajā' ib* (ca. 1000), in Ferrand (trans.) 1913–1914: 1: p. 156.

66 Ibn al-Faḳīh (902–903) in Ferrand (trans.) 1913–1914: 1: p. 56, Tibbetts (trans.) 1979: p. 30.

67 Al-Dimashḳī, 1874: p. 205, and in Ferrand (trans.) 1913–1914: 2: p. 380.

68 Al-Idrīsī, 1836–1840: 1: p. 83, and in Ferrand (trans.) 1913–1914: 1: p. 187.

69 Ferrand (trans.) 1913–1914: 1: p. 153.

70 Aḥmad ibn Rosteh [Rusta] (ca. 900–903) in Ferrand (trans.) 1913–1914: 1: p. 74.

71 Waṣṣāf in Ferrand (trans.) 1913–1914: 2: p. 360, Tibbetts (trans.) 1979: p. 60; Ibn Baṭṭūṭa, 1994: p. 880 (also in *al-Jāwa* = Sumatra).

72 Coedès, 1968: p. 241 (A.D. 1082 or 1102).

73 Ibn Ḥauqal [10th century] (ed. and trans. W. Ouseley) 1800: p. 133; Anon. [Ibn al-Balḳhī, early twelfth century] (ed. and trans. G. Le Strange) 1912: p. 322. On Aden, see al-Idrīsī (1154) 1836–1840: 1: p. 51 (specifying clove, nutmeg, mace); on Alexandria, Benjamin of Tudela [1159–1173] (ed. and trans. M. N. Adler) 1907: p. 76 ("merchants from India bring thither all kinds of spices").

74 Najm ad-Dīn 'Omārah (1121–1173), in H. C. Kay (trans.) 1892: p. 8.

75 Goitein, 1973: pp. 119, 133, 214.

76 Cahen, 1964: pp. 282, 288.

77 González de Clavijo (trans. G. Le Strange) 1928: p. 285.

78 Ibn Khurdādhbeh, 1865: pp. 293–295, 1889: p. 51, and in Ferrand (trans.) 1913–1914: 1: p. 31.

79 Al-Ghāfiqī of Córdoba, 1932–1938: 2: p. 368. Ishāk, who belonged to Baghdād, emigrated to North Africa and entered the service of the ruler of Kairouān.

80 Al-Ḳalḳashandī (ed. and trans. O. Spies) 1936: pp. 16–17.

81 Concerning what was known as cinnamon and cassia (whether from the Far East, or from India, Arabia or East Africa), see Laufer, 1919: p. 543, Raschke, 1978: pp. 652–655, Casson, 1984: pp. 225–246.
82 Levey, 1961: pp. 403–404.
83 Ya-'ḳūbī (trad. G. Wiet) 1937: p. 240.
84 Al-Bīrūnī, 1973: 1: pp. 114, 265.
85 Vasco da Gama, 1898: pp. 23, 36, 41, 45. See also Cabral (1500–1501) 1938: pp. 92, 122. Pêro da Covilhã, who reached the west coast of India by way of Alexandria and the Red Sea ca. 1488–1490, also reported that cloves, "brought from a distant country," as well as other spices, could be obtained in Calicut (Francisco Álvares [1540], trans. Lord Stanley of Alderley [1881], revised and edited by C. F. Beckingham and G. W. B. Huntingford, 1961: 2: pp. 373–374).
86 Johnson, 1939: 1: p. 73 (*kafuri* = camphor, *karafuu* = cloves, *maiti* = corpse); Ibn Baṭṭūṭa [1352], 1994: p. 954.
87 Anon. (ed. and trans. V. Minorsky) 1937: p. 61.
88 Ferrand (trans.) 1913–1914: 1: pp. 164–166.
89 Ḳazwīnī, 1868: p. 229, and Ferrand (trans.) 1913–1914: 2: p. 307.
90 Ibn al-Baiṭār, 1877–1883: 1: p. 379 (nutmeg); Ducros, 1930: p. 105 [184]; al-Ghāfiḳī, 1932–1938: 2: p. 368 (nutmeg); 'Abd ar-Razzāḳ [ca. 1720] (trad. L. Leclerc) 1874: pp. 82 [196] (nutmeg), 250 [613] (sandalwood), 298 [742] (clove); Ibn Māsawaih, in Levey, 1961: p. 403 (clove); Levey, 1962: p. 48 [323] (clove); al-Kindī, 1966: pp. 218, 220 (clove); al-Bīrūnī, 1973: 1: p. 114 (nutmeg); Kamal, 1975: p. 120 (clove).
91 Levey, 1961: pp. 403–404.
92 Levey, 1961: pp. 397–398. Al-Mas'ūdī [ca. 950] (1861–1877: 1: p. 367) named the same five (musk, aloes, ambergris, saffron, as well as camphor).
93 Al-Kindī, 1948: pp. 186–187, 204–207, 297–300, 342–345. For perfumes generally in Arabic literature, see Ullmann, 1970: pp. 313–316; Wiedemann, 1970: pp. 415–430; Hassān and Hill, 1986: pp. 141–144.
94 Levey [Ibn Māsawaih] 1961: p. 404.
95 Ibn Sīnā, 1556: p. 274 (*nuce muschata*).
96 Kamal, 1975: p. 480.
97 Al-Bīrūnī, 1973: p. 114 [37].
98 'Abd ar-Razzāḳ, 1874: p. 82 [196].
99 Farmer [al-Kindī] 1955–1956: p. 36; Levey [Ibn Māsawaih] 1961: p. 403; al-Bīrūnī, 1973: 1: p. 265 (quoting al-Rāzī, d. 925).
100 Al-Ya'ḳūbī, 1937: p. 240.
101 Meyerhof, 1931: p. 47.

102 Ibn Taghrī Birdī *Ḥawādith ad-Duhūr* (ed. W. Popper) 1942: pp. lv, 247. 10; Wiet, 1955: p. 137. Ibn Baṭṭūṭa (ca. 1350) 1994: p. 882 ("What is brought to our country is the wood," in, admittedly, a very imperfect account of the clove, which he claimed to have seen).
103 Ibn al-Baiṭār, 1877–1883: 1: p. 379 (nutmeg); al-Bīrūnī, 1973: p. 273 [33] (clove).
104 Meyerhof, 1931: p. 47; Sahlān ibn Kayṣān [10th century] (ed. and trans. P. Sbath and C. D. Avierinos) 1953: p. 38; al-Kindī, 1966: pp. 112, 120; al-Samarḳandī (ed. and trans. M. Levey and N. al-Khaledy) 1967: pp. 66, 134.
105 Ibn al-'Awwām (trad. J. J. Clément-Mullet) 1864–1867: 1: pp. 392–394. Maimonides [1135–1204] (1964: p. 31) recommended rose water and a dusting of finely pulverized mace at times of intense heat.
106 Renaud and Colin, 1934: p. 153 [351].
107 Al-Bīrūnī, 1973: 1: p. 265.
108 Ibn Bādīs, in Levey, 1962: pp. 48–49.
109 Levey, 1971.
110 Al-Bīrūnī, 1973: 1: p. 265.
111 R. Burton (ed. and trans.) 1885: V: p. 192 (n. 4 "preparation made by levigating [sandalwood] on a stone called in India *sandlásá*").
112 Levey, 1961: p. 404.
113 Al-Kindī, 1948: pp. 343–345.
114 Abū'l Fazl-i-'Allāmī ('On Perfumes', in the *Mode of Government of Akbar*, ca. 1590) 1973: pp. 74–75.
115 Al-Kindī *Aqrabādhīn*, 1966: p. 120.
116 Maimonides (ed. and trans. S. Muntner) 1963: p. 67 [XII. 67].
117 Ibn Māsawaih [ca. 850] 1562: p. 345 col. 3 F; Ishak ibn 'Imrān (d. ca. 907) in Ibn al-Baiṭār, 1877–1883: 3: pp. 127–128.
118 Ibn al-Wardī, 1974: p. 453.
119 Firdausī [referring to the sixth century] 1838–1878: 2: p. 239, 4: pp. 63, 721, 5: pp. 93, 227, 255, 257, 6: p. 541, 7: p. 405.
120 Tajuddin, 1956: p. 29.
121 Leclerc, 1876: 1: pp. 87 ff; Holmyard, 1936: pp. 100–101; Temkin, 1955: pp. 135; Siassi, 1963: pp. 366–374; Nasr, 1968: pp. 188–190; Hamarneh, 1969: pp. 271–272; Anawat, 1970: p. 766.
122 Neuburger, 1910–1925: 1: p. 393; Laufer, 1919: p. 580; Holmyard, 1936: p. 104; Meyerhof, 1937: pp. 25–26, 1944–1945: pp. 1860–1861 ("in India more active drugs are to be found than in all the other six parts of the world together," quoting Abū Manṣūr Muwaffaq); Subba Reddy, 1959: pp. 25–34; Filliozat, 1970: pp. 67–70.
123 Levey, 1961: pp. 394–410.

124 Jābir (ed. and trans. A. Siggel) 1958: especially pp. 208–211 (clove, mace, nutmeg, sandalwood).
125 Meyerhof, 1941: p. 95 (nutmeg, cloves, sandalwood).
126 Ibn al-Baiṭār, 1877–1883: I: pp. 378–379 (nutmeg), II: pp. 383–384 (sandalwood), III: pp. 64–65 (clove).
127 Meyerhof, 1938b: pp. 432–460.
128 Maimonides, 1940: pp. 38–39 (nutmeg); (ed. S. Muntner) 1957–1959: 1: pp. 97 (clove), 109 (nutmeg), 1963: p. 67 (*Santalum album*); (ed. and trans. A. Bar-Sela, H. E. Hoff, E. Faris) 1964: pp. 24, 30, 31 (cloves, mace), 36 (sandalwood, nutmeg), 39 (cloves, mace); (trans. M. Meyerhof and R. Rosner) 1979: pp. 29 (mace), 57 (nutmeg). On the spice trade in Mamluk Egypt, see Fischel, 1958: pp. 163–164; on the Jewish *Flora*, Loew, 1924–1934: I: pp. 60–63 (nutmeg), 275–279 (cloves), II: pp. 341–346 (sandalwood).
129 Goitein, 1967–1983: 2: pp. 263–264 ("It is perhaps no exaggeration to say that about a third of the *Geniza* letters that have a more detailed address [in addition to name and city] are directed to the Square of the Perfumers."). There also was a Square of the Perfumers in Alexandria.
130 Goitein, 1963: p. 196, 1967–1983: 1: pp. 154–155, 264, 2: pp. 261, 263–265, 1970: pp. 52, 56, 1973: pp. 17, 175; Stillman, 1973: pp. 49–52.
131 Goitein, 1973: p. 228 (a lone example from Fanṣūr, Sumatra, the principal port for camphor).
132 Goitein, 1967–1983: 1: pp. 154, 253, 1973: pp. 67–68, 70, 98, 121, 224, 257. See also Gottheil, 1930–1931: p. 432 (sandalwood), 1935: pp. 138–140 (sandalwood, cloves).
133 Alpini (trad. R. de Fenoyl) 1980: II: pp. 324, 350, 366.
134 Forskål, 1775: pp. 148–150.
135 Meyerhof, 1918: pp. 197–198 (including red as well as white sandalwood); Ducros, 1930: pp. 21, 38–39, 83, 105. Meyerhof (in Maimonides, 1940: p. 39) observed that since the suppression of the trade in *ḥašīš* (hashish) lower-class Egyptians have added nutmeg to tea as a stimulant.
136 'Abd ar-Razzāḳ, 1874: pp. 55, 82, 250, 298; H. P. R. Renaud and G. Colin (ed. and trans.) *Tuḥfat al-Aḥbāb* [? early eighteenth century] 1934: pp. 46, 153. Hilton-Simpson (1922: pp. 67, 77) reported from Algeria the use of cloves in dressing wounds and treating headaches.
137 Al-Bīrūnī, 1973: p. 207.

CHAPTER 4

The Medieval West

Spices and Aromata[1]

Supply

Food has always been an important guide to personal status: what you eat, how it is prepared and served, where and with whom you eat, even the time at which you eat. Perhaps even more socially revealing in times past were the contents of the family spice cupboard and the medicine chest, the two being closely related in origin and use. Spices in food were usually regarded as medicinal, aiding the digestion as well as improving the flavor.[2] The connection between diet and physical well-being must have been apparent long before the Middle Ages. The first herbals were effectively medical encyclopaedias. "Coquina que est optima medicina" [1390].[3]

For most people over countless centuries, condiments, aromatics and drugs were of local or, at the most, regional origin, products of the field and garden (Figure 14), hedgerow, woodland and marsh.[4] Species (M. Eng. *spices*[5]), generally known as 'herbs,' were first selected and sampled for their color or appearance, taste or scent. Chaucer's (ca. 1385) poor scholar scented his lodgings with *herbes swoote*.[6] Something unusual or bizarre was likely to catch the eye and excite the imagination. Likewise, an item from beyond the region, formerly known only by reputation, would be especially prized.

The most sought-after spices, whether condiments or drugs, were increasingly exotics and often aromatics, appealing to the evocative sense of smell. Sweet-smelling herbs were associated with Paradise and the Garden of Eden.

When Sire Jean de Joinville was in Alexandria with Louis IX (1226–1270), he was told that all the spices sold in Egypt had come from the terrestial Paradise, implying somewhere to the east, Persia or India.[7] The hot, dry lands of the Mediterranean and the Levant were rich in *aromata*, and the Roman occupation of North West Europe inevitably increased the number of such products in circulation north of the Alps. The empire at its full extent included a large part of the Near East, one of the two major zones of aromatic species, and was in contact with India, hub of the Asiatic trade in spices and through which the products of South East Asia, the other Old World zone, usually passed en route to Europe. Earlier, Hellenistic expansion and colonization in and around Central Asia, to the borders of India and China, laid the foundations of European contact with the East. The homelands of cloves and nutmegs (the Moluccas and Banda) and of sandalwood (Timor) lay at the eastern extremity of the South East Asian zone.

Spices were typically of low bulk and high value, rising in price to the purchaser with distance from the point of origin and with the number of merchants through whose hands they passed, each taking his own share of the profit. The most prized came from areas at first far beyond the knowledge and even the imagination of Europeans. By the central Middle Ages, when Europe's commercial axis stretched from northern Italy, through Champagne to the Low Countries, cloves and nutmeg-mace were among the most remarkable of oriental imports. The western sector of the great 'Indian' spice trade was initially controlled by Jewish and Levantine merchants, and then by men of the north Italian cities, notably Venice.

Sources of Information

Sources of information about spices in the central and later Middle Ages, ca. 1100–1500, fall into four broad categories:

First, there are encyclopaedic works on natural history and natural science, *physicalia*, together with companion compilations, more numerous and more specialized, on botany (*herbaria*) and, above all, on various aspects of medicine: materia medica (*de simplicibus*), health manuals (*hortus sanitatis*), prescriptions (*formulariae, antidotariae, receptariae*), medico-botanical glossaries, pharmaceutical handbooks, and official pharmacopoeias. Many works are combinations of these; in all, there is much repetition and wholesale borrowing without acknowledgment.

Second, from about the thirteenth century, we have books on food and wine, diet, and cuisine. Virtually all the more important Old World spices were then

Figure 14. A herb garden with stills. Hieronymus Braunschweig *Liber de Arte Distillandi.* 1500.

known in Europe and used in medicine or in cookery and often in both. Cloves and nutmeg-mace were highly appreciated; only their price controlled demand.

Third, important sources of information concern the buying and selling and movement of spices, not alone but typically with many other commodities by

general merchants, as revealed in business letters and accounts, valuations, mercantile handbooks, tariff schedules, provincial and municipal statutes, and port books. Leading purchasers often kept meticulous accounts of expenditure and fortunately some of these have survived.

Finally, there are miscellaneous documents that mention spices only in passing—grants by charter, diplomas, personal letters, wills, lawsuits, records of travel, plays, and poetry. In 1320, the Augustinian priory of Newark in Surrey was granted land in Newark itself on condition of "rendering annually to the donor and his heirs one clove (*gariofilus*),"[8] selected apparently as an appropriate symbol of overlordship.

Means of Dispersal and Centers of Consumption

The demand for exotic spices was chiefly met by trade, from the great fairs of Champagne, Bruges and Medina del Campo (Maps 7 and 8) and the permanent spicers' shops of important cities, to the weekly markets of small towns in every part of Europe. The range and quality of the products on offer declined down the hierarchy. Intermittent and generally small demand from the countryside was met by the nearest towns. We also hear of gifts of herbs and spices and of exchanges between monastic houses and cathedral chapters[9] as payment for services rendered, in response to particular requests or simply as acts of good will toward communities remote from normal sources of supply. The gradual replacement of generosity and reciprocity by regular purchases was experienced over time by successive parts of the continent, eventually to the most isolated.[10]

Centers of consumption lay chiefly in the upper half of the social and economic hierarchy: royal courts, noble households, leading monasteries and cathedrals, rich merchants (many also purveyors of spices), the medical schools, and fashionable practitioners. The kind and quality consumed and the regularity of use again broadly reflected purchasing power, for there can be no doubt that spices were fully appreciated among those who could afford to pay. The majority of consumers were probably town dwellers, mostly below the rank of those already mentioned, but close to retail sources of supply.

NOMENCLATURE

Clove

Clove, *cloue* in the sixteenth century, is from French *clou* (Latin *clavus*), nail, referring to the appearance of the dried, aromatic flower-bud.[11] The word for

nail or, better, 'little nail' (Russian *gvozdika*, Persian *mekhak*, Rumanian *cuiçor*) is also incorporated in one or other of the names for clove (spice nail) in German, Dutch, Spanish, Italian, Portuguese (*cravos da India*),[12] Catalan (*clavell*), Basque (*iltze-belar*, nail grass), Albanian (*gozhdë hindi*), Czech, Hungarian, Latvian, Estonian, and, much further afield, in Tamil (*kirāmpāni*) and Chinese (*ting hsiang*). When the comparison was first drawn is unclear. Paul of Aegina's (ca. 615–690) remarkably accurate description of cloves makes no reference to nails. The earliest known allusion in Western literature is *gariofiles nelchin* in the *Physica* (*de plantis*) of the German Benedictine nun Hildegard (ca. 1170).[13] A fourteenth- to fifteenth-century Dutch version of the *Circa Instans* of Platearius (twelfth century) has *gariofels naghel*.[14]

Similarly shaped is the head of the clove pink (*Dianthus caryophyllus*) or gillyflower, Edmund Spenser's *gelliflowre*.[15] 'Gilly' is from French *girofle* (O. Fr. *girofre, gilofre*),[16] which, in turn, corresponds to medieval Latin *gariofilum*.[17] Middle French has *clou de girofle*,[18] and Chaucer *clowe-gylofre*.[19] The combination goes back to Anglo-Norman *clous gilofrez*.[20]

The Portuguese historian Diego do Couto (ca. 1600) associated "Castilian *gilope*," meaning clove, with the large island of *Gilolo* (Halmahera),[21] adjacent to the Moluccas. That the two words are related is, however, improbable. By the middle of the thirteenth century we find *girofe*.[22]

Whether or not Persian *khāranful* (*khār* = thorn), Arabic *karanful* and Mozarab *carónfal*[23] are etymologically related to Greek *karyophyllon* (*supra* pp. 55, 85 and *infra* p. 112), the former are certainly found in Albanian *karafil hindi*, Serbo-Croat *karanfilić*, and Turkish *karanfil*. The European nomenclature of clove is less uniform than that of nutmeg or sandalwood, which may suggest a somewhat earlier introduction and slower diffusion and rate of adoption.

Nutmeg

Nutmeg means 'musk-scented nut' or, more generally, 'aromatic nut,' from *nux moschata* and *káryon aromatikón*. Medieval Latin had *nux muscata, myristica, mirisica*, and *mugata*.[24] *Myristica* alone is used in a poetic description of the perfumed streets of Rome on the occasion of the coronation of the Emperor Henry VI in 1191.[25] Apparently no attempt was made to transcribe an oriental name.

English *-meg* comes from Anglo-Norman *mugue* or *muge*.[26] Chaucer (ca. 1386) gives *notemugge* and *notemygges*,[27] and there are several other variations in Middle English.[28] Parallel names from the thirteenth to fifteenth centuries elsewhere in Europe are: French [*noix*] *muscade* and *mugette*, Provençal *notz muscada*, Spanish *nuez moscada*, Judeo-Spanish *nu'eś mośqaḷa*, Italian *noce*

moscata, German *muscat* [*nuss*], and Dutch *note muscate.*[29–36] Portuguese had *noz moscada* and *maça nos* (ca. 1500), mace nut.[37] Mace was known as *macis* in Medieval Latin and Old French,[38] to be distinguished from Latin *macir,* a "red bark of the large root of a tree of the same name," imported from India, according to Pliny.[39]

Modern names of the nutmeg in almost all European languages keep the description musk-scented. Albanian *arrë hindi*[40] (in addition to *arrë myshku*) refers to the assumed area of origin; likewise Turkish *küçük hindistan cevizi,*[41] 'little Indian walnut.' Hungarian *szerecsendió,*[42] 'Moorish/Saracen nut (*dió*),' indicates the means of introduction.

Sandalwood

Sanskrit *candana* is recognizable in languages across the width of the Old World, from western Europe to China, and therefore effectively throughout the world. *Candana* probably displaced local names in South East Asia, following the expansion of Indian influence around the beginning of the Christian era.

Late Greek *santalinon, santalon* and late Latin *santalum*[43] become *sandalum* in medieval Latin, *sandali* in Anglo-Norman.[44] The change from 't' to 'd' may be traced to the influence of Persian *sandal* and Arabic *ṣandal.* Middle English has *saundre* and *sander* (early fourteenth century, O. Fr. *sandre*), as well as *sandal* (ca. 1400);[45] the former almost invariably refer to the non-aromatic red sandalwood (*Pterocarpus santalinus*).

Virtually all current European languages retain the central stem: French *santal, sandale;* German, Dutch, Danish, Norwegian, Swedish, and Latvian *sandel;* Italian *sandalo;* Spanish *sándalo,* Portuguese *sândalo;* Catalan *sàndal;* Lithuanian, Serbo-Croat, Slovene and Polish *sandal;* Slovak *santal;* Rumanian *santal;* Estonian *sandli;* Finnish *santel;* and Hungarian *szantál.* These are customarily combined with the word for tree, wood or timber. Albanian, uniquely, has only 'fragrant tree,' *nji drû erëmirë.*[46]

Sandal or one of its many cognates has been used from a very early period for trees that belong to two different genera: *Santalum,* notably *S. album,* white or yellow sandalwood, prized for its aromatic qualities, and *Pterocarpus, santalinus* and *indicus,* red sandalwood, a dye (santalin)-producing species ("saundres pro colore," ca. 1340.)[47] In Sanskrit the latter was known as *rakta candana,* named presumably after *candana* alone had been applied to *Santalum album.* What the perceived connection between the two genera was is a matter of speculation. They are both used in Hindu ceremonial, but so too are other tree products, such as camphor. Perhaps *Santalum album,* which is parasitic, was commonly found on *Pterocarpus santalinus,* native to southern India, and gave

rise to the notion of two, albeit dissimilar products from a single, or rather joint, source. Another possibility is that the two species were associated by name, without in fact being confused, because they were sometimes used together,[48] or another odoriferous wood was added to red sandalwood as a substitute for white sandalwood.[49] Both, applied externally as a paste or powder, were thought to have a cooling effect. But the most probable explanation lies in the fact that the wood of *P. indicus,* native to the eastern Malay archipelago, while chiefly valued as building timber and as dye-wood, also has the scent of sandalwood.[50] The description 'sandalwood' would first have been applied to *P. indicus,* perhaps in Ceram or Timor, and later, without proper justification, to *P. santalinus* in India.

BYZANTIUM AND THE ASIATIC ANTECEDANTS OF *caryophyllon*

Pliny's *caryophyllon,* in a section of the *Natural History* (ca. 70) devoted to 'Indian trees,' is apparently the first reference to the clove in Western literature, although this would hardly be inferred from the accompanying description:

> There is also in India a grain resembling that of pepper, but larger and more brittle, called *caryophyllon*, which is reported to grow on the Indian lotus tree; it is imported here for the sake of its scent.[51]

Where Pliny got this information is unknown. Theophrastus (d. ca. 287 B.C.) in his *Enquiry into Plants* says nothing about cloves, although he mentions *kōmakon* ("from Arabia"),[52] and his description is the basis of what Pliny knew of "a kind of cinnamon called *comacum*...from Syria."[53] Apicius in *De Re Coquinaria* (ca. 30) refers to neither cinnamon nor to any of the Moluccan products.[54]

Pliny had presumably never seen *caryophyllon.* The physician and botanist K. P. J. Sprengel (1807–1808) thought, for some unaccountable reason, that he meant *Vitex trifolia*,[55] a Malaysian species, the leaves of which are used medicinally. W. T. Stearn (1972), observing that *caryophyllon* consisted of the Greek words *káryon* (nut) and *phyllon* (leaf or petal), believed that it referred to the aromatic leaves of the walnut (*Juglans regia* L.), "which led to use of the name for clove and thence to clove pink, *Dianthus caryophyllus*."[56] Other species with the aroma of cloves are similarly named, either in the vernacular or in the scientific literature. A notable example of the former, and a source of some confusion, is the avens (*avancia*): clove root (*radix caryophyllata*) or *gariofilata,* Linnaeus's *Geum urbanum.* The distinction between *gariofilus* (= *caryophyllon*) and *gariofilata* was drawn in the *Sinonima Bartholomei,* a fourteenth-century botanical glossary,[57] and the latter species is illustrated in the 1548 edition of

De Omnibus Agriculturae Partibus by Petrus de Crescentius (thirteenth century) (Figure 15).[58] The clove tree was almost certainly not seen by any European before 1500.

The famous physician Galen, who settled in Rome (from Asia Minor) ca. 164, included *cariophyllis* in a prescription for a soothing ointment.[59] After Galen, the name disappears from the surviving record until the fourth or fifth century, when *caryophyllon* is found in a fragment of a Greco-Egyptian medical text, and again in a sixth-century list of herbs and spices of similar provenance.[60–62] Gold and silver caskets filled with *caryophylli* and other aromatics—saffron (*croci*), cassia, pepper—are said to have been presented to Sylvester, Bishop of Rome (314–335), by Constantine the Great.[63]

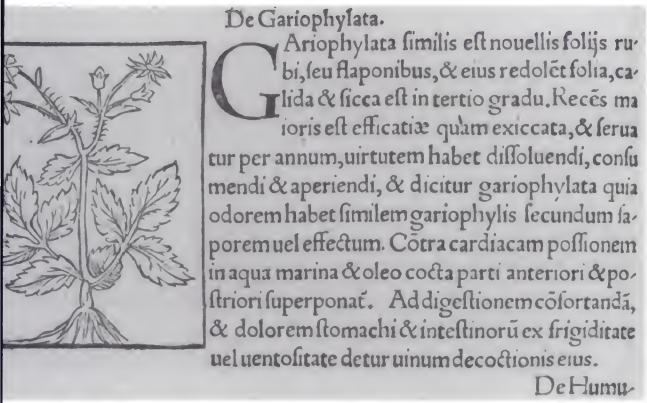
The Byzantine physician Alexander of Tralles (ca. 525–605) included cloves in several prescriptions,[64] and another Greek, Paul of Aegina (ca. 615–690), made the following perceptive observation:

> "*Karyophyllon* [is] not the substance which [the] name might imply, but, as it were, the flowers of a tree which are brought from India; like chaff, black, nearly a finger's [finger nail's ?] length, aromatic, acrid, bitterish, hot, a desiccative in about the third degree. They serve many useful purposes for condiments and other medicines.[65]

This is clearly a description of the clove and marvellously accurate for the time. Whence, however, did the misleading *caryophyllon* originate?

Caryophyllon is not found in classical Greek; and there are no (medieval) Latin names for clove that are derived from any other word. In late (Byzantine) Greek there are many variations on *caryophyllon* (B. Langkavel collected seventeen[66]), which reinforces the view that we have here Hellenized renderings and attempted interpretation, of an oriental name. Cloves were of course brought from the East, which, to the classical world, meant the Persian hinterland or, more generally (as Pliny supposed), India.

It is most often claimed that *caryophyllon* was formed from Arabic *karanful*,[67] which certainly means clove and was widely adopted following the expansion of Islam. But this is much too late for the present purpose, and it is more likely that both words stem, whether or not sequentially, from a common Indian root. I. H. Burkill, followed by Paul Wheatley, thought that *karanful* came from "the south of India,"[68] presumably belonging to one or other of the Dravidian languages. If so, the most obvious candidate is Tamil *kirāmpu*,[69] which exists alongside the Sanskrit-derived and possibly later *lavaṅga*. Tamil *kirāmpāni* means "nail resembling a clove," an interesting reversal of the widespread comparison of a clove and a nail. *Kirāmpu-p-pūṭi* was a "clove-shaped ear jewel,"[70] and a clove itself was sometimes put in the hole in the lobe of the ear to prevent its closing.[71]


De Gariophylata.

GAriophylata ſimilis eſt nouellis folijs rubi, ſeu flaponibus, & eius redolēt folia, calida & ſicca eſt in tertio gradu. Recēs maioris eſt efficatiæ quàm exiccata, & ſeruatur per annum, uirtutem habet diſſoluendi, conſumendi & aperiendi, & dicitur gariophylata quia odorem habet ſimilem gariophylis ſecundum ſaporem uel effectum. Cōtra cardiacam poſſionem in aqua marina & oleo cocta parti anteriori & poſtriori ſuperponat. Addigeſtionem cōfortandā, & dolorem ſtomachi & inteſtinorū ex frigiditate uel uentoſitate detur uinum decoctionis eius.

De Humu-

FIGURE 15. *Gariophylata,* "clove root" (*Geum urbanum* L.). Petrus de Crescentius (13th century), *De omnibus agriculturae partibus,* 1548.

Burkill may have suggested the south of India on the assumption that cloves, imported from Indonesia, were encountered there. In fact, however, they appear also to have been widely know in Āryan northern and central India from about the beginning of the Christian era and probably from the time of Alexander's incursion into Bactria and northwestern India.

The name for clove in most of the Indo-Āryan (and some Draviḍian) languages is Sanskrit *lavaṅga,* which in turn is probably of Malaysian origin. The word has no equivalent in Greek. *Caryophyllon* (and *karanful*) may be related to a Sanskrit word for pungent plants generally, *káṭukā-phala*,[72] or alternatively to *kálikā* (bud)-*phala*.[73]

When and where the Greek name was coined is again unknown, possibly in company with such other Asiatic imports as *margaritēs* (pearl)[74] and *malabathron* (Sanskrit *tamāla-pattra,* the dried leaf of some species of cinnamon[75]). In any event, there is no reason to suppose that Pliny knew the Sanskrit name or the Sanskrit basis of the Greek name and "on that account attributed [the 'grain'] to India," as J. I. Miller suggested.[76] On the other hand, the notion that cloves and nutmegs first arrived in the Mediterranean region, whether by way of the Near East or East Africa, under the general heading of *aromata,* has much to recommend it, but can never, by the very nature of the proposition, be

proved. Miller advanced this argument to explain, in part, the absence of *caryophyllon* from spices named in the *Periplus of the Erythraean Sea*, a sea-merchant's handbook probably written about the time of Pliny (ca. 50). It was long thought that the *Periplus* contains the earliest Western reference to sandalwood (*santalínon*), shipped from Barugaza on the northwestern coast of India to marts in southern Persia and the Gulf, but this is now strongly disputed.[77]

Eastern spices reached Rome by way of the Persian Gulf and the Levant or through the Red Sea and Alexandria. The opening book of Dioscuridēs' (fl. ca. 70) great *Materia Medica* is concerned with aromatic substances, but without specific reference to clove or nutmeg or sandalwood. The *De Medicina* of Aulus Cornelius Celsus, who lived in the early first century, mentions the import of sweet-smelling leaves and flowers,[78] which may have included cloves. 'Perfumes' were among the principal items of trade of Palmyra according to the Tariff Stone set up in 137.[79] In a list of commodities subject to duty in Alexandria toward the close of the second century, and inferentially much later, there are many named spices and also *aroma indicum*, which has been taken to be cloves.[80] Diocletian's tariff schedule (ca. 300) refers to sandalwood and 'spices,'[81] but to neither clove nor nutmeg specifically.

According to the anonymous *Expositio Totius Mundi et Gentium* (mid-fourth century), Alexandria was the leading emporium and entrepôt for spices,[82] particular products arriving by way of East Africa (thereby sometimes misleading Europeans over their true places of origin),[83] the Red Sea, and the Levant. Knowledge of *aromata* of remote origin spread much earlier and more widely than the items themselves. By about the beginning of the Christian era and, in all likelihood, even earlier, *caryophyllon* and *comacum* and *santalon* were known to a select few around the eastern Mediterranean, but only became significant articles of trade in the following centuries, commencing in the cities of the Byzantine empire, in Asia Minor and Greece, Egypt and the Levant. Certainly the process of familiarization long antedated the arrival of the armies of Islam and the return of the Crusaders, which have generally been credited with bringing the products of the East to the notice of the West.

In the eastern Mediterranean region, exotic species were chiefly valued as items of materia medica. Byzantine medicine[84] was grounded on Greco-Roman learning and to some extent influenced by the innovative school of Gondē-shapūr in Khūzestān (fourth to ninth centuries), which attracted Greek, Jewish, Christian (Nestorian) Arab, and Indian physicians.[85] The Alexandrian medical school—supreme from the third century B.C. or earlier—survived for a century or so after the fall of the city to the Arabs in 642.[86] Baghdād and Constantinople, along with several lesser cities of Asia Minor,[87] were significant centers of inquiry until the eleventh or twelfth century, when the balance shifted to the

Arab outposts in Sicily, Italy and Spain and, a little later, to the first generation of European universities.

Byzantine authors mention cloves more frequently than either nutmeg or sandalwood. The first to refer to nutmeg in Greek (*káryon triptón*, 'pounded nut') was Theodorus (d. 826) of the monastery of the Studium, Constantinople.[88] The more familiar name *káryon aromatikón* was used by Symeon Seth (mid-eleventh century), also of Constantinople.[89] The Greco-Egyptian merchant and later monk Kosmas Indikopleustes (sixth century) reported that *Taprobanē* (Sri Lanka) imported cloves and sandalwood,[90] and doubtless a proportion of each was traded westward.

As already shown, fragments of papyrus carry the story of *caryophyllon* back to the fifth and possibly to the fourth century. These are not confirmed by Oribasius of Pergamum (ca. 325–400), a physician and encyclopaedist who was trained in Alexandria and long resident in Constantinople. His treatment of materia medica[91] is largely based on Galen (second century). Nor does clove or nutmeg appear in herbals of the fourth and fifth centuries attributed, incorrectly, to Pedanios Dioscuridēs and Lucius Apuleius (b. ca. 125).[92] On the other hand, Philostorgius of Cappadocia (ca. 425) mentions *kariophyllon* in extolling the delights of Paradise,[93] and another passing reference, in a work modeled on the *Euporiston* of Priscianus of Constantinople, may belong to the same period, the early fifth century.[94]

In the sixth century, in addition to the notices of Alexander of Tralles (near Smyrna) and of Kosmas, both sandalwood and cloves are mentioned by Aëtios of Amida (Diarbekir),[95] who studied in Alexandria and became court physician in Constantinople. The suggestion that these (and a reference to camphor) belong to later and additional chapters of the *Tetrabiblos*[96] is not altogether convincing, for Aëtios was in an excellent position to gather information, and, as we have seen, there is contemporary and indeed earlier evidence of both products.[97] Anthimus, an exile from Byzantium, lived a little before Aëtios and became the embassador of Theodoric the Great, first King of the Ostrogoths (in Ravenna), to Thierry I, king of the Franks, 511–534 (in Metz). To the latter, Anthimus addressed a remarkable letter on the dietetic and therapeutic properties of various victuals, beverages, and condiments, including *cariofili*, pepper, ginger, and two Himalayan aromatics, costus (Sanskrit *kuṣṭha*) and spikenard.[98] Presumably, then, these were known north of the Alps at this early date, if only at the highest social level.

The *phylon indon* in the *Historia* of Theophylactus Simocatta[99] (another Greco-Egyptian who lived in Constantinople in the late sixth and early seventh centuries) may be clove, and similarly the *phylon indikon* in the *Chronographia* of Theophanes (ca. 800)[100] who was a native of the same city. The mid-

seventh-century *Chronicon Paschale* mentions *sandalin* (*sandalion*),[101] but neither clove nor nutmeg. Finally, among the Byzantines, Nicolaus *Myrepsus* (maker of ointments) who was born in Alexandria and practiced at the court of Nicaea (Bithynia) and probably also in Rome or Constantinople around the middle of the thirteenth century. His *Dispensatoreum Medicum* has one reference to *caryophylli magni*,[102] but no report of either nutmeg or sandalwood.

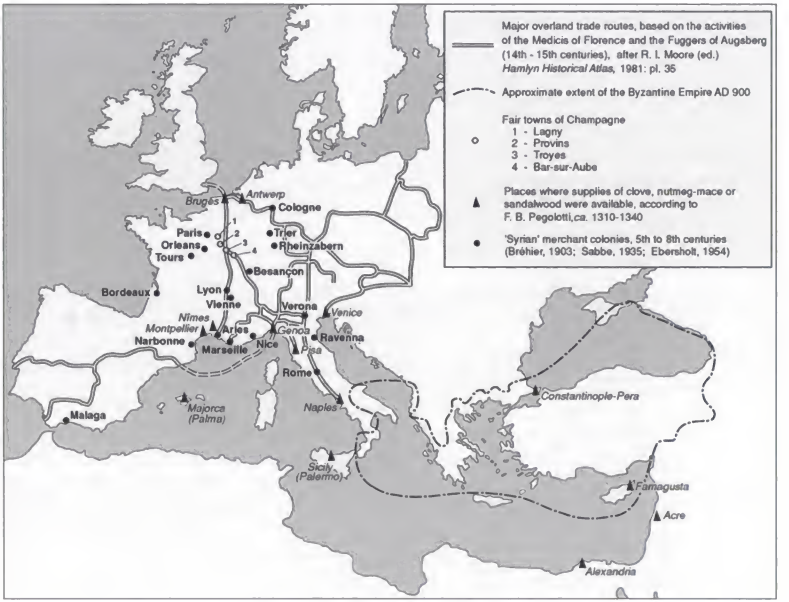
Cloves, nutmeg-mace, and sandalwood have left little trace in the classical record. The bridgehead to Europe was the Eastern Empire from the fourth century or so, more particularly the great cities of Alexandria and Constantinople, where a taste for oriental luxury and a strong tradition of medical enquiry ensured that aromatics that were already valued in India and Mesopotamia were imported. Ravenna, an outpost of Byzantium and a medical center in the sixth century,[103] may have been a notable point of entry to Europe itself.

The centers of demand and of purchasing power in Asia Minor were individually concentrated and widely scattered—royal courts, noble households, and rich monasteries, and it also was in such places that chronicles and medical treatises were compiled and now serve as our chief sources of information. References to *caryophyllon* are predominant; nutmeg and sandalwood only become more common with the growth of Arab influence in the ninth and tenth centuries. Merchants of Damascus, Aleppo, and Antioch, as well as Amalphitans and Eastern Greeks, then brought spices and aromatic herbs to Constantinople,[104] from where quantities were shipped to the rising Italian cities.

The *Ordinances* of Emperor Leo VI (ca. 900) addressed to the eparch (prefect) of Constantinople, with jurisdiction up to 100 miles around the city, name some twenty or so urban guilds. One was the perfumers, which had earlier absorbed the apothecaries.[105] Cloves and nutmeg are not among the sample of commodities listed, unless they fall under the heading of 'sweet-smelling herbs.' We are obliged to conclude that, at the close of the ninth century, although unquestionably known (and exceptionally costly), they were not among the leading aromatics obtained by trade.

INTRODUCTION OF CLOVES TO NORTHERN EUROPE IN THE EARLY MIDDLE AGES

As we have seen, there is reason to believe that *cariofili* were known, at least by reputation, at the court of Thierry I, King of Austrasia at Metz in the early part of the sixth century. Jewish and 'Syrian' merchants (*Syri*) traded spices and other eastern commodities of high value to towns north of the Mediterranean region, as far afield as the lower Rhineland (Map 7), between the fifth and the



MAP 7. Medieval Europe and the Levant.

eighth centuries, and are also said to have supplied cloves to the Papal household.[106] If so, they must have been a great rarity. The unusually well-informed Isidore of Seville (560/70–636) discussed 'spices' (aromatic trees and herbs) in his *Etymologium sive Originum*,[107] but none of these was Moluccan.

We reach firmer ground in the eighth and ninth centuries. In the *Poematum Medicum* of Benedictus Crispus, archbishop of Milan, in the late seventh or early eighth century, *cariophylus ater* appears in a remedy for arthritis.[108] More important, at about the same time (716), *cariofilio* is named, along with other Eastern spices, in a diploma granted by Chilperic II to the Benedictine abbey of Corbie, a royal foundation in Picardy, whereby the monks were authorized to draw annually on stocks held in the customs house at the port of Fos near Marseille.[109] More remarkable still, according to a document of the ninth or tenth century, the same abbey planned to purchase in Cambrai (45 kilometers away) 10 *libras* of *gariofile* and similar or even larger quantities of other spices (120 *libras* of pepper, the same amount of cumin, and 70 *libras* of ginger).[110] The growing wealth of the Carolingian church was probably the single most important component of the demand for oriental luxuries.

Gariofilus is also mentioned several times in four medical tracts (*antidotariae*) of the late ninth or early tenth century, and all apparently of North European origin.[111] In a late Carolingian document, cloves appear as *gariolo*.[112] From the same period, or a little later, the celebrated *Herbal* of so-called Macer *Floridus*—enumerating 77 plants and their healing properties—has *gariofilus*,[113] and later versions, including a Middle English (fifteenth century) translation, add *notemuge*.[114] The earliest reference to *gariofilus* (*gariofile*) of English provenance is in the medical collection known as the *Canterbury Class Book* of ca. 1100 (Figure 16).[115]

Moluccan products were first introduced to Europe by way of Egypt (Alexandria) and Asia Minor (Constantinople), cloves in the Roman period, nutmeg-mace and probably sandalwood several centuries later. The gateway was Italy, specifically Rome and Byzantine Ravenna. Small quantities of cloves were carried north of the Alps by Levantine merchants from the sixth century, conceivably a little earlier. Lombards—*negotiatiores de longobardia*—evidently attended the fair (*mercatus*) of St. Denis early in the seventh century.[116]

The reputation of a spice would usually precede and outdistance the product itself, in effect preparing the market in advance of delivery. Around the middle of the eighth century, Bishop Cyneheard of Winchester complained that certain drugs prescribed in the locally available medical texts (of Continental origin) could not usually be obtained.[117] Nevertheless, exotic spices, including cloves, were almost certainly more widely available and at an earlier period than the very limited surviving evidence enables us to prove. We are told that a

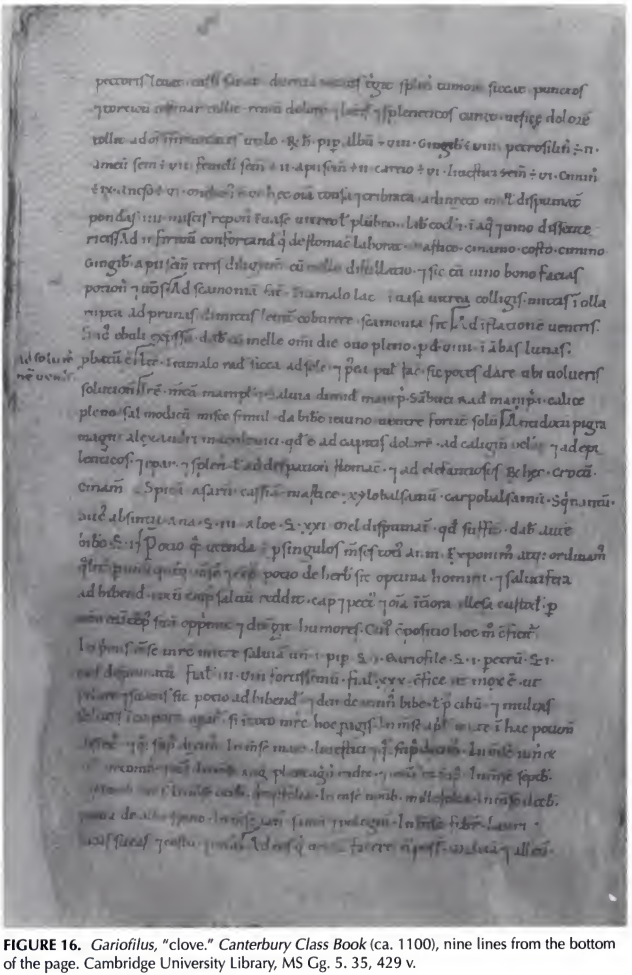


FIGURE 16. *Gariofilus*, "clove." *Canterbury Class Book* (ca. 1100), nine lines from the bottom of the page. Cambridge University Library, MS Gg. 5. 35, 429 v.

Muslim traveller who visited Mainz in the late tenth century was surprised at the range of 'Indian' spices—pepper, ginger, spikenard, costus, galingale, as well as cloves—that he found there.[118] If the monks of Corbie, albeit privileged, were able to obtain many spices in quantity in the ninth or tenth century, it is improbable that the Anglo-Saxon courts and greater monasteries of England—many in close touch with the Continent[119]—had to wait for cloves, whether obtained by trade or gift, until the close of the eleventh century, when *cariofile* is first mentioned. The Anglo-Saxon *Leechbooks* of the ninth century are silent.[120] Probably, however, this particular spice and others from the eastern margins of the Old World were then so rare and costly as to make their inclusion in a practical handbook of little or no value.

USE OF MOLUCCAN SPICES

Food and Wine

Actual spices, as opposed to simply references, are encountered in commercial transactions of one kind or other—consignments, receipts, valuations, tariff payments. Their final destination and future use are usually undisclosed, indeed at the time often unknown, but it is at least apparent that the bulk eventually found their way into a wide variety of medicinal or culinary preparations. Of the two, the former is more fully reported, albeit at second hand, in a mass of medical treatises and prescriptions. Cookery books, household accounts, and incidental statements concerning food and drink are rarer, or at least less celebrated and more scattered. Nevertheless, the probability is that in the West the larger proportion of imported spices ended up in the kitchen, where we know from adventitious evidence that surprisingly large quantities were consumed.

An anonymous, thirteenth-century document on *la cocina Hispano-Magribi* frequently mentions *clavos*,[121] less often *flores de clavo*,[122] and rarely *nuez moscada*, "sobre las bebidas" (presumably wine), and *sandalo*—both *blanco* and *rojo*, "sobre las pastas."[123] Red sandalwood (*Pterocarpus santalinus*) was used in the preparation of culinary dyes.

A Venetian *Libro di Cucina* of the fourteenth century puts 'spices' in savory jellies, both meat and fish, cloves (and ginger and cinnamon) or nutmeg (and pepper) in meat broths, and nutmeg in various sauces.[124] An English recipe for *mawmenee* (malmeny), known to the master-cooks of Richard II (ca. 1390), included *clowes* and *sāndres*.[125] By this time, cloves, nutmeg, and sanders were widely available in upper-class households, the only ones likely to possess cookery books. Felix Bourquelot thought that "le clou de girofle tenait une grande

place dans l'ancienne cuisine."[126] Wine was spiced in the ancient world, cloves and nutmeg used for this purpose from at least the thirteenth century. In 1251, on the occasion of the marriage of Henry III's daughter Margaret to Alexander III of Scotland, the English king commanded the keeper of the wines at York "to deliver of the better sort...two casks (*dolia*) of white wine to make cloved wine."[127] Chaucer wrote of (powdered) nutmeg added to ale.[128]

From monastic accounts one can usually infer the use to which spices were put. The Durham Rolls, from the close of the thirteenth century to the early sixteenth century, are particularly informative. Items entered on the extensive *rotuli celerariorum* and some at least on the *rotuli communiarorum*, *rotuli bursariorum* and *rotuli hostillariorum* were used in the kitchen—cloves (named in Latin or Middle English), mace, nutmeg, "saundres pro colore,"[129–132] and of course many other spices. In ca. 1299 and 1302–1303 several were purchased at the fair of St. Botolph (Boston), in 1310–1311 in Durham itself.[133] Accounts of the cellarer of Norwich cathedral priory (before 1350) similarly record purchases of cloves and mace.[134] Such choice and expensive items were usually bought in quantity at annual fairs frequented by London merchants.[135]

Again, in purchases by or on behalf of important individuals, the likelihood is that most spices were used for culinary purposes, some preparations having additional medicinal benefits. While detained in England (1359–1360), King John of France (or rather his steward) is known to have bought cloves (*girofle*), nutmeg, mace, and white sandalwood.[136] Accounts (1390–1393) of the expenses of Henry, earl of Derby (afterward Henry IV) in England, Calais, Prussia, and Venice list, in all, several pounds of cloves, a "confect[ion] of cloves," nutmeg, mace, and sanders "for tinting jellies and sweetmeats."[137] There is no reason to believe that the above purchases were in any way exceptional within the sectors of society to which they belonged. They suggest a substantial consumption of imported spices, even at a time, before 1500 and the opening of the sea route to India, when relative to other comestibles they were very expensive. During and for some time after the Middle Ages even important households in comparatively remote areas depended on annual fairs for supplies of spices and exotic foodstuffs.[138]

Materia Medica

Jewish doctors, pharmacists, and traders in Eastern spices were prominent throughout the Middle Ages in all parts of Europe. The professions were sometimes combined, or one led to an other. According to Rabbi Benjamin of Tudela (ca. 1159–1173), there were about 600 Jews in Salerno "where the Christians have a school of medicine."[139] Benjamin also remarked on the "merchants of

India [who] bring to [Alexandria] all kinds of spices."[140] Alexandria was probably the single most important immediate source of spices bound for Italy. Substantial amounts also came from Constantinople and the cities of southern and western Asia Minor. Traders from Damascus and Aleppo frequented Bursa (ancient *Prusa*, near the southern shore of the Sea of Marmara), where the purchasers of spices and dyestuffs were chiefly Jews of Constantinople.[141] Jews were active in the spice trade of Marseille in the middle of the thirteenth century, when at least one recorded consignment included *clous de girofle*.[142] Saladino Ferro, Jewish author of *Compendium Aromatariorum* (1486)—reputedly the first European work composed specifically for apothecaries, rather than for botanists or physicians[143]—was born in Ascoli Satriano, Apulia, where Benjamin found about 40 Jewish families in 1165.[144] A remarkable collection of about 100 medical prescriptions in Judeo-Spanish, assembled ca. 1600, refers to all the Moluccan spices and to yellow and white sandalwood—*śandaloś amarioś* and *ś. blanqoś* (both *Santalum album*).[145]

A large part of the evidence concerning Moluccan products in Europe during the central Middle Ages comes from Italy: first, Salerno, followed, between the late twelfth and the early fourteenth centuries, by a richly urbanized zone extending from central and northern Italy to southern France and Catalonia. All find a place in two exceptionally important works of early to mid-twelfth century Salerno: the *Liber de Simplici Medicina* of Matthaeus Platearius (d. 1161),[146] commonly known as the *Circa Instans*, and the *Antidotarium* (collection of prescriptions) of Nicolaus *Praepositus*,[147] director of the School. *Triasandali* was an electuary that combined the sandalwoods.[148] There are even earlier references in the *De Gradibus Simplicium* of Constantinus Africanus (d. 1087),[149] who resided in Salerno before moving to Monte Cassino. The *Simplicium* is, however, generally believed to be based on—in fact, largely a translation of—a work by Ibn al-Djajjār (d. ca. 1004), a Jewish physician, also known as Isaac Judaeus, who was born in Egypt and practiced, from about the age of 50, in Kairouān (Tunisia). Further commentaries (without much if anything that is new) on the three spices and the three kinds (colors) of *sandalus* appear in *Flos Medicinae Scholae Salernitanae*[150] and various *Tabulae Salerni*,[151] all of the twelfth century.

After Salerno, the most famous center of medical learning was Montpellier. There were close connections between the two schools. Bernardus de Gordonio, whose *Practica seu Lilium Medicinae* (1303) was one of the best known medical textbooks of the Middle Ages, studied in Salerno, then taught in Montpellier and later in Valencia,[152] an example of the peripatetic careers of many of the leading physicians, giving ample opportunity for the circulation of ideas, techniques, and drugs. Arnau de Villa Nova (1235–1311), a Catalan physician

who taught in Montpellier, Barcelona, and Paris, has at least one reference to *gariophyllus*.[153] Guy de Chauliac, physician to three popes (Clement VI, Innocent VI, Urban V), was one of the stars of the School of Salerno. He was living in Avignon in 1348 and attending Clement VI when the Black Death struck the city. His *Inventarium* (1363) described *garifioli* or *clowes* as a "sweet smelling spice"[154] used in pomanders in times of epidemic disease. The Catalan Johannes Jacobus (Jean Jasme) expressed doubt concerning the value of carrying a *pomum ambrae* "unless it be mixed with camphor and sandal [wood], as otherwise it will attract corrupt air to the heart."[155] Simon [Cordo] of Genoa, an earlier papal physician, "travelled in the East for the study of plants," and his elaborate *Synonyma Medicinae* (1292) has all the Moluccan products and the Arabic name (*karunfel*) of *gariofilus*.[156]

Nicolaus *Myrepsus*, a Greek physician who practiced in Rome and Constantinople in the thirteenth century, provides an early reference to 'mother cloves' –*caryophylli magni*[157]—the mature fruit of the tree. The better known Lanfranc of Milan flourished in southern France; his *Chirugia* (ca. 1296), first published in Lyon, mentions the use of white sandalwood in several prescriptions.[158] Matthaeus *Silvaticus* (d. 1342) of Mantua built on the work of Simon of Genoa, and among the 720 entries in his *Pandectae Medicinae* are *gariofilus, nux muscata,* and *sandalium*.[159] A pharmaceutical inventory of 1398 from Pinerolo (near Turin) includes cloves and mace and three kinds of sandalwood,[160] but omits nutmeg. Finally, Rufinus (fl. 1287), evidently Italian, but about whom little else is known, was the author of a magnificent herbal, all the more important in that the sources quoted are predominantly oriental. Cloves, clove leaves (*folia gariofilum*), ? wild cloves (*gariofilum agreste*), nutmeg, mace, and sandalwood are all discussed at length.[161]

The first landmark north of the Alps and Pyrenees was the *De Viribus Herbarum,* attributed to Macer *Floridus,* who was probably Odo of Meung (on the Loire), a poet of the first half of the eleventh century. This has already been mentioned in discussing the introduction of cloves to northern Europe (*supra* p. 118). The scene then shifts to Germany and Scandinavia. Earliest and most remarkable are the accounts of clove (*gariofiles nelchin*) and nutmeg-mace, but not sandalwood, in the section on plants (a kind of herbal) in the encyclopaedic *Physica* of Hildegard[162] (1098–1179), founder of the convent of Rupertsberg near Bingen. Hildegard, Germany's first medical writer, was also a considerable traveller and may actually have seen the Moluccan spices, something which cannot be assumed of authors of early references.

The sixth book of *De Vegetabilibus Libri VII* by Albertus Magnus (d. 1279) is also a herbal, with similar entries on clove and nutmeg and, additionally, notices of *macis* and *sandalis*.[163] Albert studied in Padua (the university, founded

in the thirteenth century, became famous for its faculty of medicine) and taught in Paris and Cologne and earlier in various Dominican seminaries in Germany. The relevant entries in Conrad von Megenberg's *Das Buch der Natur*[164]—the first natural history written in German—owe a good deal to Hildegard and Albert and to the Italian authorities, especially Platearius. The same also is true of the work of the Dane Henrik Harpestraeng (d. 1244),[165] "the earliest Scandinavian writer of note on natural history and medicine," who may have visited Salerno.[166]

The Moluccan spices and sandalwood, *albi et rubei,* are named in *receptariae* and *antidotariae* of English origin—in a mixture of medieval Latin, Middle English, and Middle French—of the late thirteenth or very early fourteenth century.[167] There are earlier notices in the *De Proprietatibus Rerum* (ca. 1230–1250) of Bartholomaeus *Anglicus*.[168] The herbal in the *De Proprietatibus* has been described as "the most notable work of its kind by an Englishman of the Middle Ages,"[169] although, as suggested by the description *Anglicus,* he appears to have spent much of his time abroad, in fact in Paris and Magdeburg. John of Gaddesden (ca. 1280–1361), otherwise Joannes *Anglicus*, probably studied in southern France,[170] and was "the first Englishman to be appointed court physician to an English monarch." His *Rosa Medicinae* (ca. 1314) is a painstaking compilation, useful and popular at the time, but unoriginal. The references to clove, nutmeg, mace, and sandalwood[171] summarize the state of knowledge or opinion at the beginning of the fourteenth century.

Of greater interest are the actual purchases of Moluccan spices by the infirmarers of the cathedral priories of Durham[172] and Norwich[173] and, on one occasion, a Christmas gift from the infirmarer to the abbot of St. Albans that included both mace and cloves.[174] Medical prescriptions of the fifteenth century regularly list cloves and nutmegs,[175] especially for stomach complaints. The phenolic properties of clove oil were appreciated and the oil was applied in dressing open wounds.[176] Official (city) pharmacopoeias begin to appear about this time,[177] that is on the eve of the discovery of the Spice Islands by Europeans. One of the earliest, if not the first, printed pharmacopoeia, issued in Florence in 1498, included all the Moluccan spices and three kinds of sandalwood (*citrini, bianchi, rossi*).[178] In the same year, they were purchased by Vasco da Gama in Calicut before returning by way of the Cape to Lisbon.

TRADE IN MOLUCCAN SPICES

Until the opening of the all-sea route to the Indies, spices reached Europe by way of the ports of the Levant and the Black Sea and, to a much lesser extent (at least after ca. 1200), along a variety of land routes through Armenia and

Asia Minor. The latter were of greater importance during the early Middle Ages when the leading market was Constantinople. Even in the fifteenth century, however, Bursa obtained spices from Egypt and Syria and traded them to Constantinople and countries to the north, the Balkans, Moldavia, Poland, and Russia.[179] Spice merchants—Armenians, Jews, Greeks—"coming from the East" were active in the towns of southwestern Russia.[180] Entrepôts around the Black Sea such as Trebizond handled commodities that originated in or passed through Persia and/or India.

Commercial contracts of the Genoese in the Syrian trade date from the twelfth century,[181] when opportunity followed the Crusades, but reasonably detailed information on the volume of traffic, prices, and profits belongs largely to the late fourteenth and the fifteenth centuries, when the Levant trade was at its height.[182] Private trade, absent from the official records, which are impressive enough, may have amounted to 30 per cent of the total.[183]

The principal Levantine ports were Beirut, Acre, and Alexandria, the shippers Venetian, Genoese, Pisan, and Catalan, generally in that order of importance. The Catalans acquired Eastern products in Sicily and Tunis,[184] as well as the Levant.[185] From about the second quarter of the fifteenth century, the Venetians enjoyed supremacy, even a "de facto monopoly."[186] The Venetian merchant Marino Sanuto recorded in his remarkable *diarii* (1501–1511) the prices in Alexandria of *garofalo, noxe muschade, mazis*, and *sandali bianchi*, among many other commodities.[187]

Supplies came by way of the Red Sea (to Alexandria) and overland from Persia (Tabrīz[188]) or the ports of the Persian Gulf to Damascus and Aleppo.[189] Here and at the Mediterranean ports, 'spice fairs' were held on the arrival of the European galleys. Eastern goods that passed through the customs houses of the Kingdom of Jerusalem (the Franks themselves took little part in this traffic) included, *nois mouscades, clos de giroffle*, and *feilles dou giroffle* (clove leaves).[190] Purchases depended more on supply than demand, and this in turn on the volatile political situation along the caravan routes. Profits to shippers were almost invariably high, on average 40 per cent, to set against equally high risks—robbery, extortion, physical violence, bureaucratic intrigue, to the point where the Venetians threatened to suspend trade. When, in the early fourteenth century, they imposed a ban on trade with the Muslims, Eastern commodities were obtained through intermediaries in Armenia, Crete, and Cyprus (Famagusta).[191] The spice merchants of Muslim Spain[192] looked to the cities of North Africa, especially Tunis.

Demand in western Europe remained high even during the economic crisis of the mid-fourteenth century[193] and matched or even exceeded the growth in supplies in the fifteenth century. Therein lay the opportunity for large profits.

At the beginning of the fifteenth century (1418–1420), "cloves were 72 per cent more expensive in Venice (and in other south European commercial centers) than on Levantine markets."[194] At the close of the century (1496–1498), "the usual difference in price [of nutmegs] between Alexandria and Venice was not less than 220 per cent."[195]

Substantial shipments of spices around the Cape by the Portuguese from 1503[196] had a depressing effect on the Levant trade for three or four decades; then the latter began to recover and with it the fortunes of the Italian and Provençal cities. Business letters of the Marseille merchants *Les Frères Hermite* to and from Aleppo, Alexandretta (the port of Aleppo), and Tripoli in the second half of the sixteenth century often mention consignments of *muscades, girofles,* and *macis.*[197] In addition, the old routes by land and sea continued to serve the very large internal market in the Near East itself. Portuguese squadrons off Malabar and Hormuz never succeeded in blocking the sea lanes.

After 1500, first Lisbon and then Antwerp,[198] London, and Amsterdam became leading importers of spices as demand in Europe continued to rise. Prices fluctuated with supplies, but remained generally buoyant, especially for products of high quality. The condition in which spices arrived after very long voyages varied considerably and with it prices and profits. Once landed in Europe, whether at Mediterranean, Atlantic, or North Sea ports, tracing their subsequent movement in response to localized and scattered demand—ultimately to individual or institutional consumers, some of whom have already been mentioned—presents formidable difficulties. Fragments only of the network of supply and demand can be reconstructed from an adventitious variety of commercial documents, chiefly Italian: trade manuals, the records of merchant houses and individual traders, and tariff charges imposed by city councils and sovereign princes.

Il Manuale di Mercatura of Saminiato di Guciozzo de' Ricci (1396–1416) draws attention to the pivotal role of Damascus in the supply of Moluccan products prior to the opening of the Cape route. The *manuale* also gives the cost of transporting cloves from Genoa to Rome and from Venice to Avignon.[199] Giovanni di Antonio da Uzzano's better known *La Practica della Mercatura* (1442) quotes the tolls (*gabella*) on the above commodities in Pisa, Siena, and Florence.[200] A *Book of Wares and Usages of Diverse Countries* (1458) from Ragusa (Dubrovnik)[201] gives advice to buyers, thus:

> Cloves ought to be black and reddish within and tend slightly more to the black than to the red.
>
> [Stalks of cloves, *fusti di gherofani*] ought to be fuzzy and be thick and dry and clear of [bad] stems.

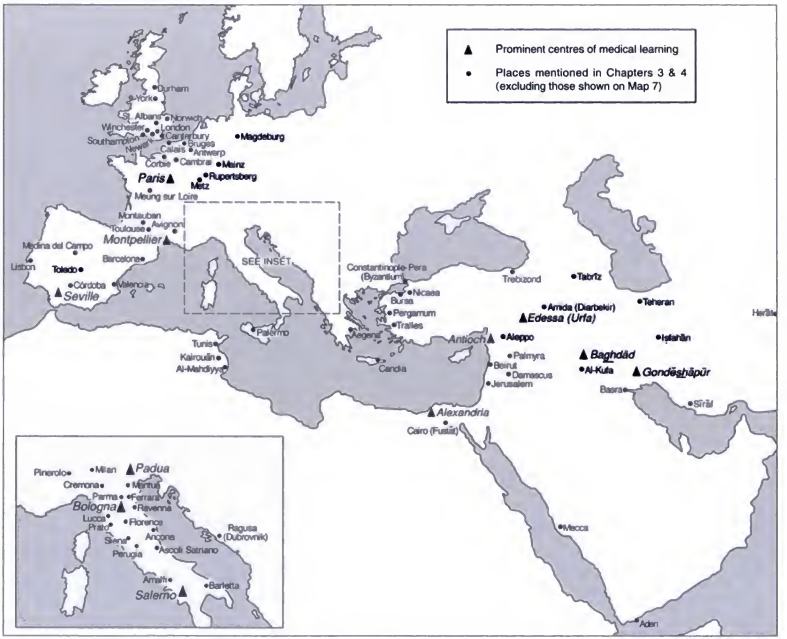
Stalks or stems of the clove flower-bud were sold for a third or less of the price of cloves and as a substitute for, or to adulterate, the superior product. They contain between one-quarter and one-third of the amount of aromatic oil in the buds.

> Nutmegs ought to be large and firm and their surface clean; and there are some who say that they ought to be more than one-fourth wrinkled. And they ought not to be unripe.

Bartolommeo di Pasi's *Tariffa de Pesi e Mesure* (Venesia, 1503) itemizes the cost of transporting cloves, nutmegs, mace, and sandalwood between Damascus and seven southern European cities, including Venice, and thence between Venice and seven other Italian cities: Verona, Padua, Ferrara, Bologna, Cremona, Mantua and Parma.[202]

The most famous and most useful manual—also named *La Practica della Mercatura*—was the work of Francesco Balducci Pegolotti,[203] a member of the banking house of Bardi in Florence. *La Practica* was compiled from a variety of sources, including other merchants' reports, over the period ca. 1310–1340, and could only have been a general guide to prices and quantities at any one time. The places listed (Map 7) are those where supplies could normally be obtained in quantity by wholesale merchants, rather than the many other places where spices were available on a retail basis. Moreover, even for wholesale supplies, the list must be regarded as incomplete, the result of inadequate information and presumably of selection of the most convenient places for Italian merchants. Clove leaves (*foglie di gherofani*), sometimes used as a substitute for cinnamon (*folio indio = Cinnamomum tamala*),[204] are given for Venice, Nîmes, and Montpellier; stalks (*fusti*) for more places around the Mediterranean, including Alexandria and Famagusta, and Constantinople and Pera.[205] Cloves, nutmegs, and mace could be obtained in Acre, and, at the opposite end of Pegolotti's geographical range, cloves, and nutmegs in Bruges, and mace in Antwerp. *Sandali* was available in Alexandria, Famagusta, Majorca, Venice, Genoa, Nîmes, and Montpellier. Other places not mentioned above that are regularly reported in connection with Moluccan spices are Pisa, Naples and Sicily (? Palermo).

Among the sources that shed light on the traffic in spices in medieval Europe, the accounts of business houses are most informative. *Les Frères Bonis*, merchants of Montauban (35 kilometers north of Toulouse) in the fourteenth century, traded in a variety of goods over an extensive area. Spices were not particularly prominent, but they included *girofle, macis,* and *muscada* (*noix muscade*).[206] More voluminous are the records of the house of Francesco Datini, who was born in Prato (1335) but worked mainly in Florence and Avignon,



MAP 8 Medieval Europe and the Near East.

a papal see between 1309 and 1377. The firm had branches (*fondachi*) in Genoa, Barcelona, Valencia, and Majorca, as well as correspondents in many of the chief cities of western Europe and the Levant.[207] Like most great medieval merchants, Datini dealt in an extraordinary number of products, including virtually the whole range of Eastern spices. At different times, bales of *garofani* are reported at Ancona, Barletta (Apulia), Genoa, Nîmes and Venice; *macie* at Barletta, Nîmes, and Venice; *noci moscati* at Ancona, Candia (Crete) and Nîmes; and *legno di sandalo* also at Nîmes.[208]

Another important collection of Italian documents (chiefly, for the present purpose, from the late fourteenth and early fifteenth centuries) refers to all the Moluccan products: cloves, leaves (*foglie*), and stems or stalks (*fusti, gambi*) of clove; nutmegs (*salde e rotte*); mace (*fine, grossa, minuta*); and red and white sandalwood. Business letters concerning one or other or several of these passed between Perugia and Pisa, Perugia and Genoa, Genoa and Majorca, Damascus and Barcelona, Damascus and Venice, London and Venice, Alexandria and Venice, and Antwerp and Florence.[209] There are also reports of valuations of the same commodities in Bruges, London, Damascus, and Alexandria;[210] references to shipments between Alexandria and Barcelona, Beirut and Barcelona, and Venice, London, and Bruges;[211] and, most remarkable of all, news of caravans (1395, 1425) with quantities of Moluccan spices moving between Aleppo and Damascus, Mecca and Damascus, and Basra and Damascus,[212] on the periphery of European commercial intelligence.

Further traces of the movement of spices lie in the surviving records of tariffs levied in cities and regions: cloves or nutmegs or mace or sandalwood (or some combination of these) are listed for Provence, Lyon, and Marseille[213–215] in the thirteenth century, Paris in the thirteenth and fourteenth centuries,[216] Pisa in the fourteenth and fifteenth centuries (including leaves and stalks of cloves),[217] Siena and Florence in the fifteenth century.[218] The Italian trade with England lay chiefly through Southampton, and "outstanding among the merchandise unloaded from the galleys...were the spices employed so lavishly by generations of medieval cooks in wealthy households."[219] The Port Books of the second half of the fifteenth century, especially the *Liber Alienigenus*, record landings of balets (or pipes) of cloves and nutmegs and of barrels of mace[220]—the final stages of a journey that had often lasted several years and involved scores of traders. In the process, the price of each commodity rose at least a thousand-fold, if indeed any such calculation is possible when the inhabitants of the islands where the spices grew at first put little or no value upon them.

Notes

1 The latter mapped and more fully discussed in Donkin, 1999: pp. 1–35.
2 To Thomas Mun (1621), spices were "most necessary to preserve health and to cure diseases" (J. R. McCulloch ed., 1954: p. 8). Billing and Sherman (1998: pp.1–38) argue that spices (widely interpreted) in fact serve to reduce the incidence of food-borne microbial diseases, especially in tropical environments. See the critique by McGee, 1998: pp. 649–650.
3 Samuel Pegge (ed.) *The Forme of Cury* [*Cookery*] (comp. ca. 1390), 1780: p. 122 [*colophon*].
4 In the Ancient world, rustic herbalists were known as 'rootcutters' (*rhizotomoi*). See Nutton, 1985: pp. 139–140.
5 Both from Latin *species* (Minsheu, 1627: p. 682; Bréal and Bailly, 1885: pp. 358–360; Trench, 1890: pp. 259–260).
6 Chaucer (ed. F. N. Robinson), 1957 [*The Miller's Tale*]: p. 48, line 3204.
7 Joinville (French text ed. Natalis de Vailly, trans. Joan Evans), 1938: p. 56.
8 *Calendar of Charter Rolls*, 1300–1320: p. 430 (this is the first reference to cloves in the published Charter Rolls).
9 Voigts, 1979: pp. 259–261.
10 Grierson (1959: pp. 131–140) stressed the importance of gift-exchange, rather than trade, in accounting for the movement and destination of valuable commodities, including spices, during the Dark Ages, and the custom undoubtedly survived in a variety of forms into and indeed beyond the Middle Ages.
11 Not to be confused with Old English *clufe*, "a clove, the bulb or tuber of a plant," "an ear of corn," a "clove of garlic"—Bosworth and Toller (1898), 1921: p. 160; Oliphant, 1966: p. 53 [322]; Bierbaumer, 1975–1979: 3: p. 54 (*clufu*). The idea that cloves are so called because "they resemble the claws of a bird" (Paludanus in Huyghen van Linschoten [1596–1598], eds. A. Coke Burnell and P. A. Tiele, 1885: 2: p. 83) is entirely unsupported.
12 Ainsley, 1826: 1: p. 75.
13 Hildegard in J.-P. Migne (ed.) 1885: p. 1142.
14 Platearius, ed. L. J. Vandewiele, ca. 1972: pp. 25 ff.
15 Spenser *Shepherd's Calendar* [1579], 1930: April, line 137. The description 'gillyflower' is applied to several plants with flowers scented like clove, including the wallflower and white stock.
16 Bloch and Wartburg, 1964: p. 295; Rothwell, 1992: p. 102.
17 John Mirfeld [Marfelde] (ed. J. L. G. Mowat) *Sinonima Bartholomei* (fourteenth century), 1882: p. 22; *Alphita* (ca. 1400), ed. J. L. G. Mowat, 1887: 3:

p. 292; Latham, 1965: p. 208; Hunt, 1986: p. 111, 1989: p. 125. According to Gabriel Rebello (1561–1569), *cravo maduro* (ripe clove) was known in the Moluccas as *giroso,* with which the editor, Artur de Sá (1954–1958: 3: p. 370 and n. 85), compared French *girofle.*

18 Cotgrave (1611), 1971: n. p.

19 Chaucer, 1957: pp. 165 (*Tale of Sir Thopas*), 578 (*clowe-gelofre,* in *The Romaunt of the Rose* [1361], trans. by Chaucer). *Clowe* also in S. Pegge (ed.) [ca.1390], 1780: p. 19 [XX].

20 Rothwell *et al.*, 1992: p. 102. See also Kurath and Kuhn (comps.), 'C' (1959), 1970: p. 258.

21 Do Couto in Barros and Do Couto *Da Asia,* 1778–1788: Dec. IV(2), liv. VII, cap. IX (p. 175: "Os Castelhanos ihe chamáram Gilope, porque o que leváram foi da Ilha de Geilolo").

22 Alonso, 1960: 2: p. 1197 (A.D. 1240–1250). Cf. Adam Olearius (1639), 1727: 2: p. 426; Corominas, 1954–1957: 1: pp. 818–819, 1961: p. 150.

23 Corominas and Pascual, 1980: CE–F: p. 99.

24 Mirfeld *Sinonima Bartholomei* (fourteenth century), 1882: p. 32; *Alphita* (ca. 1400), 1887: p. 223; Latham, 1965: pp. 310, 317.

25 Petrus d'Ebulo (ca. 1195), 1746: p. 23: *Imperialis Unctio*:

> "Balsama, thus, aloë, myristica, cynnama, nardus,
> Regibus assuetus ambra modestus odor.
> Per vicos, per tecta fragrant, redolentque per urbem,
> Thuris aromatici spirat ubique Rogus.
> Vestit odora viam mirthus sociata Diathis
> Luxuriant croceis lilia juncta rosis."

26 Godefroy, 1898: p. 346; Onions, 1966: p. 608; Skeat (1910), 1978: p. 406.

27 Chaucer, 1957: pp. 165, 578.

28 Stratmann, 1891: p. 455 (*-migge*); Kurath and Kuhn (comps.), 'M and N,' 1975: p. 1141; Hunt, 1980: p. 113, 1989: pp. 70, 187.

29 Bloch and Wartburg, 1964: p. 424.

30 Cotgrave (1611), 1971: n. p.; Rothwell *et al.* [Anglo-Norman] 1992: pp. 438, 450.

31 Mistral, n.d.: 2: p. 413.

32 Alonso, 1960: 2: p. 1439.

33 Crews, 1967: p. 247.

34 Vincenzo Maria di S. Caterina da Siena, 1678: p. 367; Battisti and Alessio, 3: 1983: p. 806.

35 Schade, 1969: 1: p. 632; Kluge, 1989: p. 494.

36 Onions, 1966: p. 618; Martin and Tops, 1984: n. p. (*notemuskaat*).

37 Machado, 1958: 2: pp. 1376, 1542. Cf. Eredia (trans. J. V. Mills), 1930a: pp. 60, 185.
38 Kurath and Kuhn (comps.), 'M and N,' 1975: p. 4 (Middle English *maces*, A.D. 1234).
39 Pliny (ed. and trans. H. Rackham *et al.*) 1961–1968: IV: p. 23. Possibly *Holarrhena antidysenterica* or *Ailanthus malabaricus*. *Macir* or *macer* (not *macis*) also in Dioscuridēs and Galen.
40 Mann, 1957: p. 256.
41 Fahir İz and Hony, 1992: p. 366.
42 Orszagh, 1990: p. 574.
43 Sandalwood is not mentioned by Pliny who has, however, *sandalis*, a kind of date palm (XIII. ix. 43). Ruddock (1951: p. 73) observed that the craftsmen of medieval Lucca and Florence produced a "fine spun silk called *sendali*."
44 Rothwell *et al.*, 1992: p. 676.
45 Kurath and Kuhn (comps.), 'S,' 1986: pp. 77, 123 ("wood of several trees of the species [*sic*] *Santalum*").
46 Mann, 1948: p. 327.
47 *Durham Account Rolls* (*Rot. Cel.*), ed. Canon Fowler, 1: 1898: p. 35. *Saundres* is first mentioned in the published extracts in 1329–1330 (ibid: p. 16) and thereafter quite frequently. All are interpreted as red sandalwood "used in cookery for colouring" (ibid: 3: 1901: p. 959). Similarly, *The Forme of Cury* (comp. ca. 1390), ed. S. Pegge, 1780: p. 19 [item XX, *sāndres*]. Purchases of spices (ginger, pepper, saffron, cinnamon, galanga, as well as cloves, mace, and *saundres*) are often associated with feast days.
48 Levey, 1966: p. 299 ("Hindus and Muslims combine it [red sandalwood] with white sandalwood for bathing and in religious ceremonies"). Cf. Dymock, 1890–1893: 1: p. 462, quoting U. C. Dutt, 1877 ("Both [white] sandalwood and red sandalwood are rubbed on a piece of stone with water, and the emulsions used after bathing and in religious services.")
49 Yahyā ibn Māsawaih [777–857], quoted by al-Bīrūnī [973–1051] (ed. and trans. H. M. Said and R. E. Elahie) 1973: 1: p. 207 (red sandalwood and half its weight of *qaṣab al dharirah*).
50 Burkill, 1935: 2: p. 1830 (especially the Moluccan variety of *P. indicus*, known as *linggua merah* or *linggua kasturi*). J. D. Hooker (1872–1897: 2: p. 238) gave the distribution of *P. indicus* as "Malay isles, Philippines, and China."
51 Pliny, 1961–1968: IV: p. 23.
52 Theophrastus, ed. and trans. A. Hort, 1961–1968: II: pp. 248–249 (distinct from cinnamon and cassia). J. I. Miller (1969: p. 60) thought that *kōmakon*

was nutmeg and/or mace; on which, Patricia Crone (1987: p. 71) remarked, "if so, everything can be anything." For the Greek herbalists, see also Scarborough in C. A. Faraone and D. Obbink (eds.), 1991: pp. 138–174. Whether *maccidem* in a list of spices (some altogether unidentifiable and perhaps fictitious) in the *Pseudolus* (ca. 200 B.C.) of Plautus (ed. and trans. P. Nixon, 1965: IV: p. 235) is mace is at least questionable.

53 Pliny, 1961–1968: IV: p. 95.

54 Cf. Faure, 1987: p. 225. Apicius (trans. B. Flower and E. Rosenbaum, 1958) does mention pepper, ginger, saffron, mastic, cardamom, cost, Indian nard, and spikenard.

55 Sprengel, 1807–1808: I: p. 204 (Plinius: "Vitex trifolia est Garyophyllon piperis grani simile").

56 Stearn (1972), 1992: p. 83. Káryon is any kind of nut but more particularly the walnut (Liddle and Scott, 1996: p. 881; and cf. Hunt, 1989: p. 187, under *Nux*). The leaves have been used to prepare an aromatic tea and also an insect repellant.

57 Mirfeld, 1882: p. 22. Named after the priory of St. Bartholomew (f. 1123), London, where it was compiled.

58 Petrus de Crescentius (1512), 1548: p. 216.

59 Galen *Opera Omnia* (ed. K. G. Kühn) 1821–1833: XIV: p. 462.

60 Not in two third-century works in which one might have expected to find it: Quintus Serenus Sammonicus *Liber Medicinalis* (ed. F. Vollmer, 1916), and Gargilius Martialis *Medicinae ex cleribus et pomis* (ed. V. Rose, 1875).

61 *Papyrus*, ed. A. Świderek and M. Vandoni, 1964: pp. 77–78 [36. 6].

62 *Papyrus: Collectanea*, ed. Ann Ellis Hanson, 1975–1976: II: p. 87 [561].

63 Vignolus *Liber Pontificalis*, 1724–1752: I: p. 94.

64 Alexander of Tralles, ed. and trans. F. Brunet, 1933–1937: II: pp. 92, 235.

65 Paul of Aegina, ed. and trans. F. Adams, 1844–1847: III: p. 160.

66 Langkavel, 1866: p. 19.

67 On the contrary, Renaud and Colin (1934: p. 153 [351]) state that *karanful* was the Arabized form of *karyophyllon*.

68 Burkill, 1935: I: p. 961; Wheatley, 1959: p. 45.

69 *Tamil Lexicon*, 1924: 2: p. 926 (here < Urdu *qaranful*). *Kāy* to "bear fruit," *pū* = flower (Burrow and Emeneau, 1961: pp. 103 [1220], 288 [3564]). Dymock (1890–1893: 2: p. 21) observed: "[Arabic] *karanfal*, a name evidently derived from the Indian languages of the Malabar Coast (Tamil, *kirámbu*), Ceylon (Cingalese, *karámbu*), and the Straits (Malay *karámpu*)...."

70 *Tamil Lexicon*, 1924–1939: 2: p. 926.

71 Khory and Katrak, 1903: 1: pp. 64–65.

72 Weber, 1868–1869: II: p. 121 [92]; Meyer, 1893: p. 31; Vollers, 1896: p. 650, 1897: p. 301.
73 Miller, 1969: p. 50 n. 3 ("*Kálikā-phala*, the bud plant, is therefore an alternative source of *caryophyllon*," citing Professor T. Burrow).
74 Donkin, 1998: pp. 52–55.
75 G. W. B. Huntingford (ed. and trans.) in *Periplus*, 1980: p. 134.
76 Miller, 1969: p. 50.
77 *Periplus* (G. W. B. Huntingford) 1980: p. 40 [36], ibid. (L. Casson) 1989: pp. 73[36], 258 (teak rather than sandalwood). *Santalínon*, later *sándanon, sántalon, santal, sandalin, sandalion* (Langkavel, 1866: p. 88, Sophocles, 1900: p. 978).
78 Celsus, ed. and trans. W. G. Spencer, 1935–1938: I: p. 316, II: pp. 15, 212. Ginger is mentioned once (II: p. 56), but not camphor. The *De Medicina* was one of the first medical books to be printed (1478).
79 Chabot, 1922: p. 27.
80 Tariff of Marcus Aurelius and Commodus, recorded by Aelius Marcianus, and preserved in the *Digest of Justinian*, eds. T. Mommsen and P. Krüger, English trans. A. Watson, 1965: III: p. 407. Spices conveniently listed in Miller, 1969: pp. 279–280. Schoff (1912: p. 289) gives *caryophyllon* in place of *aroma indicum;* and cf. Miller, *op. cit.* p. 51 (*garyophyllon*).
81 T. Mommsen (ed.) and H. Blümner (interpr.), 1958: IX. 12 ff., XXXII. 52 ff.
82 Anon., ed. A. Riese, 1878: p. 171 [XXXV]. Egypt has a long history of interest in aromatics, many of them imported. See Joret, 1897–1904: II: p. 304; Lucas, 1930: pp. 41–53; Rostovtzeff, 1932: p. 746, 1941: I: pp. 389–390, 1957: I: pp. 74, 157, 169; Johnson and West, 1949: pp. 125–130; Ghalioungul, 1963: pp. 138, 143; Georgiou, 1973: pp. 441–456; Shelmerdine, 1985: p. 11; Nunn, 1996: pp. 15, 152.
83 Notably cinnamon and cassia. See Casson, 1984: pp. 225–246.
84 Bloch, 1902: pp. 492–588; Temkin, 1962: pp. 97–115; Stannard, 1985: pp. 205–211 (*materia medica*, including cloves); Scarborough, 1985: pp. 213–232 (pharmacology).
85 Donkin, 1999: pp. 26–27, 109–110, 229.
86 Meyerhof, 1930: p. 405, 1933: p. 13; Temkin, 1935: pp. 405–430.
87 On Byzantine cities and the Byzantine economy in the early Middle Ages, see Ostrogorsky, 1959: especially pp. 63 ff.
88 Theodorus Studita, ed. J.-P. Migne, 1860: col. 1716 B. Said and Elahie (ed. and trans.) in al-Bīrūnī (1973: 1: p. 117, n. 60) claim that nutmeg "probably reached Constantinople in about A.D. 540," but give no authority.
89 Seth, 1561: p. 56.

90 Kosmas, ed. and trans. J. W. McCrindle, 1897: pp. 54, 366–367. Kosmas's real name was Constantine of Antioch. *Indikopleustes* = Indian navigator.

91 Oribasius, ed. and trans. U. C. Bussemaker and C. Daremberg, 1851–1876: V: pp. 603–723. André (1956: p. 75) gives Oribase, *cariofilum*, which I cannot find. There are several references (II: p. 657, V: p. 553) to *giroflée* (gillyflower), not *girofle* (clove).

92 R. W. T. Gunther (ed.) *Herbal of Apuleius Barbarus*, 1925; F. W. T. Hunger (ed.) *Herbal of Pseudo-Apuleius*, 1935; Riddle 'Pseudo-Dioscorides' *Ex herbis femininis*, 1981: pp. 43–81.

93 Philostorgius, ed. J.-P. Migne, 1858: col. 493 B.

94 Theodorus Priscianus, ed. V. Rose, 1894: p. 408 [Pseudo-Theodorus].

95 Aëtios, 1542: pp. 926–928 (*sandalorum, caryophyllorum*).

96 F. Adams (trans.) in Paulus Aegineta, 1844–1847: III: p. 437.

97 On the other hand, Aëtios' *nuces indicas* (*op. cit.*, p. 928) were almost certainly coconuts, rather than nutmegs.

98 Anthimus, ed. E. Leichtenhan, 1928: pp. 5, 8.

99 Theophylactus Simocatta, ed. I. Bekkerus, 1834: p. 294 [9].

100 Theophanes, ed. I. Classeni, 1839–1841: I: pp. 429 [10].

101 L. Dindorfius (ed.), 1832: I: p. 722. The compiler of the *Chronicon*, an anonymous Byzantine cleric, lived in the reign of Heraclius (610–641).

102 Nicolaus *Myrepsus*, 1626: p. 23.

103 Riché, 1976: p. 70.

104 Diehl, 1957: p. 86; Citarella, 1967: pp. 299–312 (Amalfi), especially 300, 312; Runciman, 1987: pp. 140–141, 156.

105 The latest and best edition is by J. Koder (trans. German), 1991: pp. 111–113 (X: Drogisten), 119–121 (XI: Gemischtwarenhändler). English trans. by E. H. Freshfield *Eparchicon Biblion*, 1938: pp. 29–32 (perfumers), 35–36 (grocers). Cf. the detailed description of the trades and retailers of Constantinople in Evilyā Chelebī (ca. 1670) *Travels*, trans. Ritter Joseph von Hammer, 1834–1835: I (ii): especially pp. 117–118, 212–213. The grocers (*attárán*), with 3000 shops, sold cloves and other Eastern spices.

106 Heyd (1879), 1936: 1: pp. 20–23, 125–128; Bréhier, 1903: p. 21; Pirenne, 1922: p. 83, 1939: pp. 79–96, 174; Sabbe, 1935: p. 811.

107 Isidore (ed. W. M. Lindsay) [1910–1911], 1971: 2: XVII. 8–11.

108 Benedictus Crispus (ed. J.-P. Migne) 1850: col. 374 [XXV]. Translated by J. Stannard, 1966: p. 38:

> Take polypody, which they call filicia
> With which crushed black cloves are well mixed
> And dates, pepper and cinnamon—pleasing to all

Frankincense and myrrh are also mentioned in other prescriptions.

109 J. M. Pardessus (ed.) 1843–1849: 2: p. 309. See also Lopez, 1952: p. 261. Corbie was founded in the 7th century by Bathilde, queen of Clovis II.

110 B. Guérard (ed.) 1886: 2: Appendix, p. 336 [II]—copy of 986, appended to statutes (822) of Abbot Adalhard, consequently dated 822–986. A similar but shorter list, including Gewürznelke, in Schulte *Geschichte des mittelalterlichen Handels und Verkehrs zwischen Westdeutschland und Italien*, Leipzig, 1907: 1: p. 73. Pirenne's contention (1939: pp. 170–171) that, following the Arab invasions, Carolingian Gaul (751–987) had few, if any, commercial contacts with the East was quickly disputed and ultimately rejected: Sabbe, 1934: pp. 186–187, 1935: pp. 811–848, 1261–1288; Lopez, 1943: pp. 14–38; Dennett, 1948: pp. 165–190. See also Hutchinson, 1902: pp. 413–432; Hodges and Whitehouse, 1983: p. 171 ("...we now possess a remarkable body of data on long-distance trade in the eighth and ninth centuries. A critical analysis of this shows that trade was directly controlled by kings and monasteries, and that its rationale was the movement of small quantities of prestige commodities and valuable raw materials.")

111 H. Sigerist (ed.) 1923: pp. 35, 44, 45, 49, 50, 54, 73, 103, 111, 117, 134, 147, 149, 150.

112 B. de Rozière (ed.) 1859: 2: p. 194 [DCCIII].

113 Macer *Floridus*, ca. 1516: lxxvi (*gariofilo*); JL. Choulant (ed.) 1832: p. 117 [LXXII]. *De Viribus Herbarum* was composed between 849 and 1112. Neuburg (II.i, 1925: p. 39) has the last quarter of the eleventh century, Stannard (1966: p. 5) the tenth century.

114 G. Frisk (ed.) 1949: pp. 181 (*clowe gelofre*), 193 (*notemuge*).

115 Cambridge University Library, Gg. 5. 35, 429 v.

116 J. M. Pardessus (ed.) 1843–1849: 2: p. 5 (a *diploma* of Dagobert I, ca. 629, in favour of St. Denis).

117 M. Tangl (ed.) 1916: pp. 246–247 (Ep. 114).

118 Jacob (1890) 1927: p. 31.

119 About A.D. 740, Anglo-Saxon missionaries in Germany planned to send pepper, cinnamon, and frankincense to Abbess Cuniburg in England (M. Tangl ed. 1916: pp. 78–80 [Ep. 49]).

120 The following are mentioned: aloes, balsam, origanum, galbanum, mastic, cinnamon, pepper, cassia, coriander, myrrh, frankincense, galingale, ginger, zedoary, and cumin (T. O. Cockayne, ed., 3 vols., 1864–1865). Voigts (1979: pp. 250–268) discusses the availability and use of drugs in Anglo-Saxon England. Cameron (1990, Bald's *Leechbook*, p. 7) lists the Moluccas among the regions from which spices were imported, but I can find nothing to support this.

121 Huici Miranda (ed. and trans.) 1966: pp. 17, 19, 23, 26, 31, 32, 41, 42, 43, 44, 45, 46, 47, 102, 115, 118, 121, 125, 221, 222, 223, 234, 235, 241, 242, 243, 252, 257, 258, 264, 265, 269, 272, 273, 280, 283, 286.
122 Ibid: pp. 267, 268, 270, 273, 281, 282, 285.
123 Ibid: pp. 267, 270, 271, 289.
124 Ashtor, 1975b: p. 273.
125 S. Pegge (ed.) 1780: p. 19 [XX].
126 Bourquelot, 1865: pt. I: p. 286.
127 Trease, 1959: p. 26.
128 Chaucer, 1957: p. 165.
129 [Canon] Fowler (ed.) 1: 1898: pp. 15, 44, 52, 56, 70, 77, 79, 127; 2: 1899: pp. 286, 289, 291, 295, 495, 503, 506, 551; 3: pp. 594, 636, 666.
130 Ibid., 1: pp. 17, 30, 37, 56, 70, 77, 79, 272; 2: pp. 291, 295, 503, 527; 3: pp. 594, 636, 666.
131 Ibid., 2: pp. 286, 289, 291, 295, 503.
132 Ibid., 1: pp. 16, 17, 32, 35, 37, 44, 48, 49, 56, 70, 77, 140; 2: pp. 527, 558; 3: pp. 614, 636, 666.
133 Ibid., 2: pp. 495, 503, 506.
134 Jenkins, 1954: p. 515; in addition, *Accounts* of Canterbury Cathedral Priory, 1467, expenditure on cloves and mace.
135 Moore, 1985: p. 57.
136 L. Douët-d'Arcq (ed.) 1851: pp. 212, 218–219.
137 L. Toulmin Smith (ed.) 1894: pp. 11, 19, 22, 153, 154, 159, 182, 219, 221.
138 For example, G. Ornsby (ed.) 1878: pp. 94–95 (purchases of mace, cloves, nutmegs, "case nutmegs," sanders, and other spices by the steward of Lord William Howard of Naworth Castle, Cumbria, at St. Luke's fair in 1618). With the decline of local and regional fairs in the eighteenth century, it became fashionable to order directly from London.
139 Benjamin (ed. and trans. M. N. Adler) 1907: p. 8.
140 Ibid: p. 76.
141 Halil Inalcik, 1960: p. 136.
142 Loeb, 1888: p. 74.
143 Saladino di Ascoli (comm. and intro. S. Muntner) 1953: p. iii. Distinctions between physician (*medicus*), surgeon (*cirurgicus*), and pharmacist (*apothecarius*) emerged in the thirteenth century.
144 Benjamin, 1907: p. 9.
145 C. Crews (ed.) 1967: p. 255.
146 Platearius, 1524: pp. xx *r* (col. 2), xxviii *v* (col. 1), xxix *r* (col. 1); L. J. Vandewiele (ed. of fourteenth-fifteenth century ms.) ca. 1972: pp. 154–156,

202–203, 211, 247. Choulant (1841: pp. 298–299) lists the 273 *simplici* in Platearius.

147 Nicolaus (ed. and trans. P. Dorveaux) 1896: pp. 5–9, 11, 16, 24, 27–28. See also Nicolaus, 1524: pp. ix *v* (col. 2), x *r* (cols. 1 and 2), xxxv *v* (col. 2), 140–150 formulas or prescriptions (Choulant, 1841: p. 285).

148 P. Dorveaux (ed.) in Nicolaus, 1896: p. 28. Mentioned in English/Irish sources in the middle of the thirteenth century (Latham, 1965).

149 Constantinus, 1536: pp. 355, 357, 369.

150 S. de Renzi (ed.) *Coll. Sal.* V (1859): p. 28 [43].

151 Ibid: IV (1856): pp. 559–560; V (1859): pp. 240, 245–246, 249.

152 The author is usually referred to as Bernard de Gordon. Sometimes described as a Scottish professor; Sarton (III [3] 1947: p. 873) says French, which is more likely. Bernardus, 1550: pp. 905, 911 (clove, mace, sandal). On the history of pharmacy in Montpellier, see Dulieu, 1973: esp. pp. 18–20. For Bernard, see Demaitre, 1980.

153 Arnaldus, 1585: p. 609 g.

154 Chauliac (ed. M. S. Ogden, fifteenth-century trans.) 1971: p. 623; see also Middle English trans. (ed. B. Wallner) 1976: pp. 55, 105, 137.

155 D. W. Singer, 1916: p. 181.

156 Simon, 1486: pp. 29 *v*., 41 *r*., 53 *v. Gariofilata* is considered separately.

157 Nicolaus *Myrepsus*, 1626: p. 23.

158 Lanfranc (ed. R. von Fleischhacker), I (1894): pp. 236, 312 (vol. II, commentary, with index, never appeared). Cf. Lanfranc (trans. I. Halle) 1565: pp. 44–45, 108—in the Table, 143 pp., the work of the translator.

159 Matthaeus *Silvaticus*, 1541: folio XCVII, cap. cccxxx, folio CXXXVI, cap. dlxxii, folio CXLIX, cap. dcxvii.

160 Appendix to Albini di Moncalieri (ed. G. Carbonelli) 1906: pp. 158, 161, 163, 164.

161 Rufinus (ed. L. Thorndike) 1946: pp. 16, 33–34, 45, 51, 54, 94, 101, 121, 138, 145–146, 180–181, 184, 248, 270, 302, 352 [*gariofilum* et. var.]; pp. 34, 43, 53, 94, 101, 121, 179, 184, 207 [*nux moscata, miristica*]; pp. 34, 179–180, 184, 213, 342 [*macis*]; pp. 55, 63, 85, 124, 271, 287–288 [*sandali*].

162 Hildegard (ed. J.-P. Migne) 1855: cols. 1139, 1141.

163 Albertus *De Vegetabilibus* [*Hist. Nat. Pars* XVIII] (ed. E. Meyer and C. Jessen) 1867: pp. 345, 395–397, 404–405, 412–413, 451.

164 Conrad (ed. H. Schulz) 1897: pp. 315, 318–319, 322.

165 Harpestraeng (ed. M. Kristensen) 1908–1920: pp. 39 (*geroforsnag[h]lae*), 42 (*muskat, muskat blomae*).

166 Sarton, 1927–1948: II: pp. 659–660.

167 Hunt, 1990: pp. 71 (42), 229 (37), 238 (40), 240 (49), 304 (52), 321 (63), 326 (2), 328 (15), 330 (24)(25), 335 (20)(22).
168 Bartholomaeus (trans. John Trevisa) 1535: lib. XVII (*De Arboribus et Herbis*) cap. lxxix, pp. ccxlii, cclxvii.
169 Sarton, 1927–1948: II (2): pp. 586–587.
170 Not in Montpellier, according to Sarton, 1927–1948: III (l): pp. 880–881.
171 John of Gaddesden (ed. and trans. W. Wulf) [1923], 1929: pp. 64, 84, 102, 116, 118, 140, 146, 148, 158, 260, 261, 286, 290. On English medical works of the fourteenth century, see G. Henslow (ed.): especially pp. 181, 218, 229.
172 [Canon] Fowler (ed.) I (1898): p. 272.
173 Jenkins, 1954: p. 515.
174 Ibid.
175 *Practica Phisicalia* of "John of Burgundy," ca. 1425–1450 (ed. H. Schöffler) 1919: pp. 208–209, 257; W. R. Dawson (ed. and trans. *Leechbook*, fifteenth century) 1934: pp. 123 (mace), 161 (cloves in a collyrium), 195, 221 (nutmeg); M. S. Ogden (ed.) 1938: pp. 33 (*clowes*, in an emplaster for dropsy), 44, 66, 70.
176 On oil (*oleum*) of clove, mace, nutmeg, see D. Sennert (d. 1637) 1650: 1: p. 798, 2: p. 369, 3: p. 850. Cf. Clementinus, 1535: especially pp. 135–156 (*electuariis*)—*gariophyli, nucis muscatae, macis, sandali;* Scaliger, 1557: pp. 205b–206a (*Myristica nux, Caryophyllum*).
177 Flückiger [Frankfurt] 1872: p. 441 (*galiofoli, folia garioffili, maces, nuces muscati, sandoli albi, s. rubei, s. citrini*), [Nördlingen] 1877: p. 101 (clove, mace, nutmeg, sandalwood).
178 *Ricettario Fiorentino*, 1498 (facs. 1968), no pagination.
179 Halil Inalcik, 1960: pp. 136, 142, 1994: p. 239.
180 Malowist, 1987: p. 556 (especially Lwów, formerly Polish).
181 Byrne, 1916: pp. 128–170, 1920: pp. 191–219. See also Heyd (1879) 1936: 2: pp. 585–587, 603–607, 644–648.
182 Ashtor, 1975b: p. 250. See also Ashtor, 1975a: pp. 573–612 [A.D. 1370–1498]. The overview of the trade in oriental spices by Bautier (1960 [1970]: pp. 263–310) is still useful and contains details not found elsewhere.
183 Wake, 1979: p. 380, 1986: pp. 621–625. Both papers tabulate imports of "Moluccan spices." Wake (1979: p. 178) gives details of Catalan imports from Alexandria and Beirut, 1379–1400.
184 Abulafia, 1985: p. 225.
185 Carrère, 1967: 1: pp. 644–649.
186 Ashtor, 1975b: p. 274.

187 Sanuto [the Younger, d. 1535] 1879–: IV (1880) p. 168; V (1881) p. 35; VI (1881) p. 64; XI (1884) pp. 57, 104, 829; XII (1886) pp. 155, 208. Marino Sanuto [the Elder, d. 1330], who travelled in the East ca. 1300–1306, referred (1611: p. 23) to *gariofili, nuces muscatae,* and *maci* in Venetian trade with "India."

188 Manandian, 1965; p. 197.

189 On goods held in Aleppo by thirteenth-century Italian merchants, see Abulafia, 1982: pp. 230–234. Oriental products were often purchased in Acre. Following the expansion of the Ottoman Turks in the second half of the fifteenth century, the maritime route shifted to the Red Sea, with Alexandria as the Mediterranean terminal.

190 *Assises de Jérusalem* (13th century), in *Rec. des Hist. des Croisades,* II (1843): pp. 173–174.

191 Ashtor, 1976b: p. 534.

192 Constable, 1994: especially pp. 151–155.

193 Ashtor, 1975b: p. 273.

194 Ibid: p. 257.

195 Ibid. On spice prices in the Near East in the fifteenth century, see also Ashtor, 1976b: pp. 26–41, especially table VII, price of cloves in Egypt, 1401–1500, and table VIII, price of cloves in Syria, 1406–1485. Reid (1990a: pp. 5, 7, 8, 12, 13, 1988–1993: 2: p. 14, 1993: p. 11) has drawn attention to the relatively large import of cloves and nutmeg to Europe in the 1390s and 1490s. See also Reid, 1990b: p.76 (chart of imports, ca. 1400–ca. 1665).

196 Wake, 1979: p. 183 (1503–1531), including "Moluccan spices"; Reid, 1988–1993: 2: p. 14 and Figure 3 (In "the Indian Ocean...the Portuguese sank or plundered every Muslim spice ship they could. No Moluccan spices at all reached the Italian ports through the Middle East in most years between 1502 and 1520.") The first cargo of spices arrived in Lisbon in 1501. See Leonardo da Ca'Masser [1504–1506] 1845: pp. 18–20, 23 (*garofoli, macis, sandali rossi*).

197 M. Baulant (ed.) 1953: pp. 18, 19, 22, 30, 34, 37, 38, 47, 92, 126, 127, 134, 137. See also Lane, 1939–1940: pp. 581, 583, 584, 587; Gascon, 1960: pp. 647–650.

198 Roover, 1938: pp. 212–221. Antwerp (1538–1544) was supplied overland from Italy and, more important, twice a year by a Portuguese "spice fleet." Demand in France was increasingly met by Marseille, which imported spices from Alexandria.

199 Ricci (ed. A. Borlandi) 1963: pp. 77, 80–81, 104, 121, 123.

200 Uzzano [1442] in Pagnini, 1765–1766: IV: pp. 22, 53, 55, 59, 81, 83.

201 In R. S. Lopez and I. W. Raymond (trans.) 1955: pp. 348–353, from F. Borlandi (ed.) *El Libro di Mercatantie et Usanze de' Paesi del Chiarini,* 1936: pp. 160–165. "Unwarrantably ascribed to Giorgio di Lorenzo Chiarini."
202 Pasi, 1503: unpaginated.
203 Pegolotti (ed. A. Evans) 1936.
204 Tomé Pires [1512–1515] (ed. and trans. A. Cortesão) 1944: 1: p. 219 and n. 1.
205 *Fusti, fiori,* and *foglia di gherofani* also mentioned by Uzzano [1442] in Pagnini, 1765–1766: IV: pp. 20 (Florence), 52 (Pisa); and in *Ricettario Fiorentino,* 1498 (facs. 1968), no pagination.
206 E. Forestié (ed.) 1890–1893: 1: pp. 104, 106, 126, 2: p. 226. For the spice trade in late medieval Toulouse, see Wolff, 1954: pp. 215–217 (including *clous de girofle* and *noix muscade*); Caster, 1962: pp. 363 ff.
207 Lopez, 1987: pp. 378–379.
208 Datini (ed. C. Ciano) 1964: pp. 59, 64, 65, 72, 75, 82. On the *Compagnia Datini,* see also Heers, 1955: pp. 157–209. Yver (1903: p. 245) observed that 'fine spices' were important in the trade of Barletta and Naples in the thirteenth and fourteenth centuries.
209 F. Melis (ed.) 1972: pp. 144, 154, 160, 184, 186, 188, 190, 218.
210 Ibid: pp. 314, 316, 318, 320.
211 Ibid: pp. 322, 324.
212 Ibid: p. 330.
213 M. B. Guérard (ed.) 1840–1857: 1 (Appendice): pp. lxxvi, lxxviii, lxxix, lxxxi, lxxxix, xci.
214 Flückiger (ed.) 1875: p. 425 (*garofalorum,* 1245).
215 L. Méry and F. Guindon (eds.) 1841–1848: 1: pp. 343, 372 (A.D. 1228).
216 Douët d'Arcq (ed.) 1852: p. 219 (ca. 1296); *Ordonnances des Roys de France* II: 1729: p. 320 (*maciz, girofle, muguettes*).
217 F. Bonaini (ed.) 1854–1857: 3: pp. 106, 115 (A.D. 1305); Uzzano (1442) in Pagnini, 1765–1766: IV: p. 55.
218 Uzzano (1442), 1765–1766: pp. 22, 81, 83. On Florence, see Ciasca, 1927: pp. 367–368 (*spezie, grosse e minute*).
219 Ruddock, 1951: p. 71.
220 P. Studer (ed.) 1913: pp. 48, 83, 85; D. B. Quinn (ed.) 1937–1938: I: pp. 46, 49, 53, II: pp. 106, 128, 197; also (I: p. 49) "six pieces of *sendale,*" which Ruddock (1951: p. 73) translates as "fine spun silk." Venetian galleys continued to call at Southampton until 1587; thereafter, imports of Levantine products, chiefly through the port of London, were in the hands of English merchants.

CHAPTER 5

China and South East Asia

People and Ships

The Malayo-Indonesian region is largely occupied by people who speak languages that fall within a subgroup of Austronesian. Ancestral Austronesian is generally located in Taiwan and adjacent parts of the Chinese mainland. Expansion southward of the subgroup apparently commenced around 4000–3000 B.C.,[1] first into the Philippines (ca. 2500 B.C.), and then to southern Malaya and Indonesia by or some time after 2000/1500 B.C. To the north and west of the zone of expansion, that is over much of mainland South East Asia, lay the Austro-Asiatic linguistic province, and to the south and east, New Guinea and adjacent islands, including northern Halmahera and part of Timor, where Papuan languages were spoken.

The Moluccas and Banda were just within the eastern frontier of the 'Central-Eastern Malayo-Polynesian zone.' Through this and other Malayo-Polynesian zones flowed people and artifacts, generally from northwest to southeast. Lapita-style pottery is broadly correlated with the later phases of Austronesian expansion from western Melanesia to Polynesia.[2] Much earlier, pottery and pottery-making spread from mainland South East Asia, but the latter seems not to have reached the central Moluccas by the close of the first millennium A.D.[3] Chinese (Han) and Indian (rouletted) pottery arrived in the Indonesian archipelago at about the same time, the opening centuries of the Christian era, the former[4] by way of Fu-nan, the latter more directly at the hands of Indian traders (*supra* pp. 63, 71 and Map 3).

For several millennia before the period of Austronesian expansion, the greater part of Indonesia could only be reached by a series of sea crossings and longer voyages. The Moluccas were never attached by land bridges to the Sunda Shelf (Sundaland during the Ice Ages) or to Australia, or indeed to each other. Consequently, passage by sea was at all times necessary.

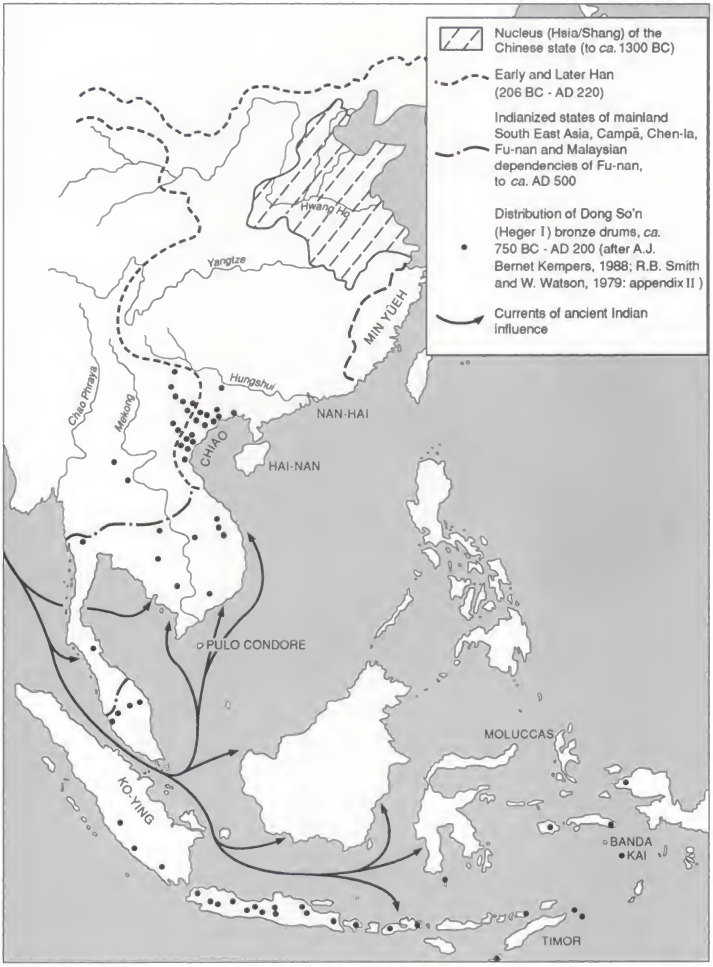
Descriptions and representations of sea-going vessels operating in Eastern waters before the arrival of Europeans are surprisingly scarce. The finest illustration of a large Indian ship, of the early sixth century, comes from a fresco in the caves at Ajanta, south-central India (Figure 13).

> Three high masts and a bowsprit, rigged with their respective sails, are clearly depicted. It is fitted with intricate steering gear, unmistakably of the double quarter-rudder type. All these features are shared with later Southeast Asian ships. Whether this is because the artist wanted to represent a foreign ship or the result of technical affinities between the two areas remains to be proved.[5,6]

The Ajanta ship may have been similar to the *kolandiophōnta* that sailed, according to the Greek *Periplus* (four centuries or so earlier), between the ports of eastern India and South East Asia (*supra* p. 64). The Greek name has been plausibly derived from Chinese *k'un-lun-po*,[7] a large, foreign merchant ship with two to four masts, usually crewed by men of *K'un-lun* (maritime South East Asia) and first recorded in the third century.[8] I-Tsing (671–673) used a Malay ship between Sumatra and India[9] and the Buddhist monk Amoghavajra (741) between China and Sri Lanka.[10]

The earliest evidence of sea-going ships of peoples of South East Asia are representations on bronze kettledrums.[11] The center of origin of these drums, "among the most developed products of metalwork in the whole of South East Asia,"[12] lies in southernmost China (Yüeh and Dian cultures) and adjacent Tonkin-Annam (Dong So'n culture, named from a village in northern Annam), dating from about 500 B.C., certainly from before the southward expansion of the Han. Over the following millennium, drums (chiefly Heger I type) were carried through the southern flank of the Malayo-Indonesian archipelago as far east as western New Guinea, the Kai Islands and "the Moluccas,"[13] but not apparently, to Halmahera or the five Spice Islands (Map 9). Drums were manufactured to a limited extent in the archipelago,[14] but the majority, including some from the most easterly locations, came from the mainland (Tonkin–Fu-nan) and provide the most remarkable evidence of demographic and cultural dispersal, presumably aided by the westerly monsoon (November–April).

The drums are of particular ethnographic interest on account of their elaborate and realistic decoration. Shown are (a) various pile-dwellings, (b) Chinese characters and people in Chinese (Han) dress, (c) warriors of Kuṣāna or Yüeh-



MAP 9. China and South East Asia.

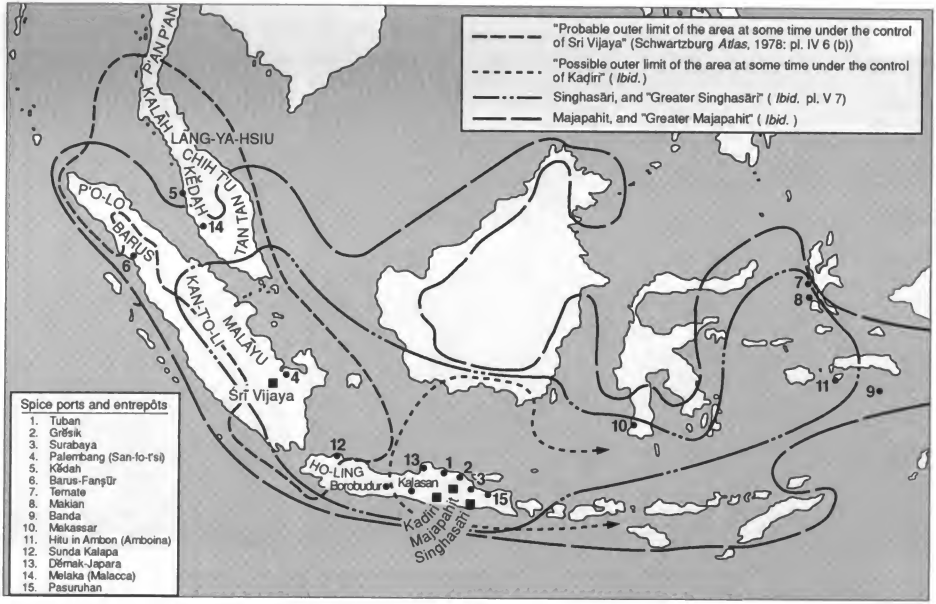
chih appearance, and (d), most important, boats, from simple canoes to larger vessels of advanced design.[15–18] The portraits point to the presence or influence of Chinese folk in and around Tonkin, rather than to any direct Chinese involvement in the manufacture and diffusion of the drums.

In Miao (Yüeh) folklore, the drum itself is sometimes a ship.[19] Representations may incorporate bird-like features, which perhaps symbolize outriggers. From the Sung (960–1279) there are descriptions of a Yüeh ship known as the sea falcon (*hai ku*), with "floating planks" on either side to give stability in high winds and heavy seas.[20] Whether or not the (double) outrigger originated around the shores of the South East Asian mainland, which seems likely but is still debateable,[21] in time it came to be associated with Indonesia,[22] to the virtual exclusion of China and the mainland generally.[23]

Indian and Chinese seafarers and merchants in the ports of South China were supplied with Moluccan products by Malays and Indonesians. Neither Indian nor Arab vessels are known to have reached the Moluccas before 1500. It was more convenient to obtain supplies in Java, Sumatra, or Malaya. The Chinese did sail to the Moluccas, but only relatively late, probably in the thirteenth century. The trading junk was not particularly well suited to the shallows and reefs around the islands.[24]

The most spectacular representations of early East Asian craft are sculpted in panels on the great early ninth-century temple of Borobudur[25] in central Java (Map 10, Figure 17). The ships are Indonesian, not Indian, as earlier claimed.[26] The ten or eleven carvings depict vessels of different size and type, from canoes with upturned ends (similar to the *orembai* of the Moluccas) to the great 'galleys' with elaborate outriggers, to which the *kora-koras* of the Moluccas, which survived into the seventeenth or eighteenth century, were clearly related. Unfortunately, we have no documentation on the Borobudur ships or records of particular voyages. The concensus of opinion is that the large vessels, with two tripod masts and outriggers supported on paired booms, were not trading craft, but rather fighting and/or passenger ships, again like the greater *kora-koras*. However, the smaller, single-masted vessels, without outriggers, might well have been used for trading. The canoes could have served as tenders in home waters.

There can be little doubt that from about the beginning of the Christian era, or even earlier, Indonesians in general were well equipped to act as intermediaries between producers and consumers of Moluccan and Bandanese spices and Timorese sandalwood. The Javanese *prahu* and *jong* depicted (Figure 18) in Willem Lodewycksz's account of the first Dutch voyage to the East Indies (1596) are probably similar to the ships in use in the fourteenth and fifteenth centuries.



MAP 10. Peninsular and Insular South East Asia.

Figure 17. East Asian vessels sculpted in stone on the early ninth-century temple of Borobudur, central Java (N. J. Krom [and T. van Erp] 1927: pls. XLIII[86], XLIV[88], LIV[108]).

Figure 18. Javanese *prahu* (A), fishing boat with outrigger (B), and Javanese *jong* (C). Willem Lodewycksz [under C. de Houtman], *De eerste schipvaart der nederlanders naar Oost-Indie* (1595–1597).

The Moluccan *orambai* or *orembai* (Figure 19) resembled a gondola[27] and was doubtless used in moving between closely spaced islands and for servicing larger ships. The greater *kora-koras* (Figures 20 and 21),[28] as suggested above, were warships and ceremonial barges. The prominent outriggers and outboard platforms, seating banks of men using paddles, would have had many disadvantages and few, if any, advantages, for trading purposes. In fact, the inhabitants of the clove islands were not deep-sea traders at the time of the arrival of Europeans, or earlier so far as we are aware. Substantial quantities of cloves were regularly concentrated at Makian (Figure 4) where there was a good harbor, then shipped to Banda, often by the Bandanese who did have suitable trading vessels. In any event, the world trade in cloves and nutmegs before ca. 1500 depended on contacts made and maintained by Malays and Indonesians and specifically by Javanese. Inter-island trade survived alongside the activities of Europeans. Thomas Forrest, voyaging in the East Indies (1774–1776), "learnt of two Molucca prows (*prahu*) at Sulu, loaded with nutmegs and mace."[29] He also heard that on Ceram and *Ouby* (Obi), runaway slaves from Ternate and

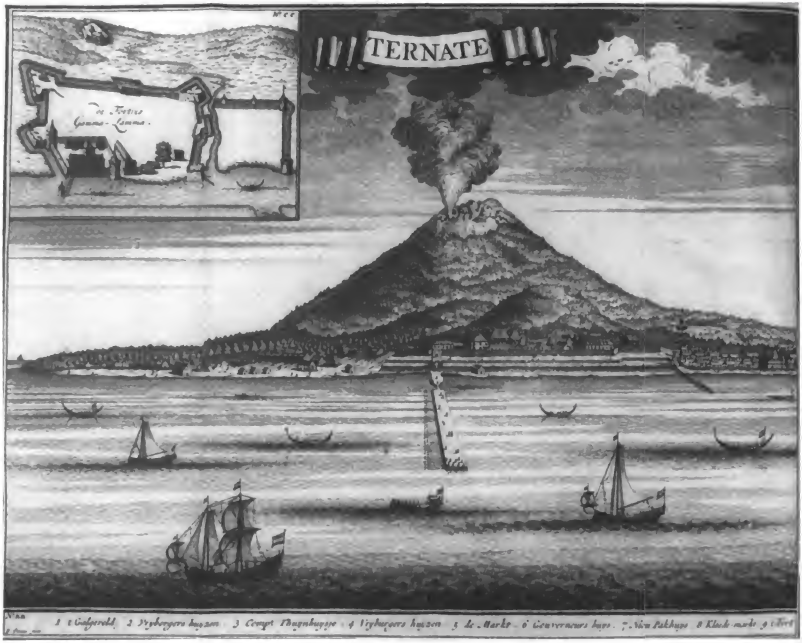


Figure 19. Prospect of Ternate, with *orembais* ('gondolas'). François Valentijn *Oud en Nieuw Oost-Indiën*, 1724–1726: I(ii).

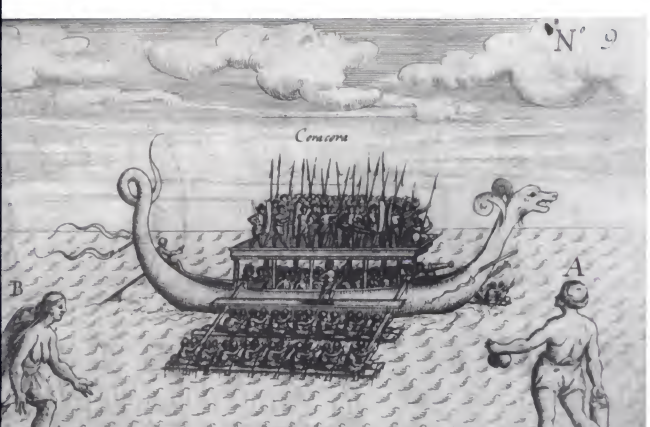


Figure 20. A large *kora kora* of Banda (1599). J. Corneliszoon van Neck, *Le Second Livre, journal ou comptoir...*1601.

elsewhere sold cloves to captains of Buginese prows.[30] From the early seventeenth century, *kora-koras* were reported as far afield as the Philippines.[31] Such vessels, used for trade, began to lose, or had already lost, their distinctive features: outriggers and outboard platforms, and paddles were replaced by oars.

CHINA

The Chinese homeland lay in the north, between the Huang Ho and the Yangtze Kiang (Map 9). Expansion southward commenced under the Ch'in (221–207 B.C.), the first united empire, and continued under the Western (or Former) Han (206 B.C.–A.D. 8) and the Eastern (or Later) Han (25–220). The Ch'in reached the Southern Sea over the Five Passes at Nan-hai (P'an-yü), thereby separating large coastal territories occupied by the indigenous Yüeh. Before 100 B.C., Chinese rule had been extended to subtropical northern Annam (Chiao),[32] around the Gulf of Tongking, leaving only the extensive

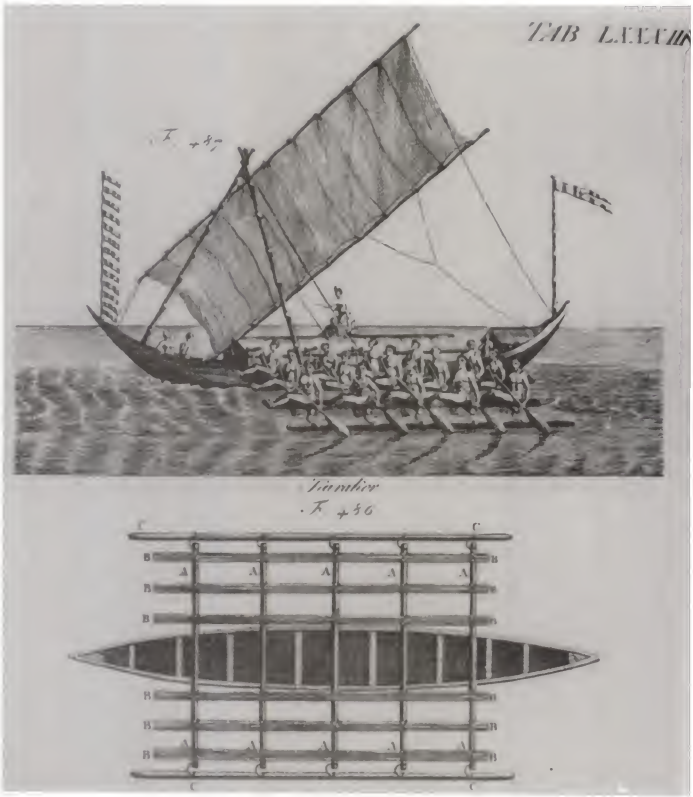


Figure 21. *Kora kora.* J. H. Röding, *Allgemeines Wörterbuch der Marine,* 1794–1798: IV.

domain of the Min Yüeh (Fukien) facing the Eastern Sea. Chiao served as a coastal corridor between the mainland of South East Asia and China as a whole. Henceforth, even when China was divided, as under the Three Kingdoms (third century), the luxury products of the South were more readily available in the North than before the expansion of the Han. Chinese reports of such products included Chi Han's *Plants of the Southern Regions* (provinces of Chiao-chou and Kuang-chou) of A.D. 304.[33] The motive for expansion southward was economic rather than political, in contrast to the parallel drive to the west. Most important, it took place at approximately the same time as the early, if not the first, expansion of Indian influence into Fu-nan and Lin-yi (Campā) during the opening centuries of the Christian era. Outposts of the two great civilizations met in northern Campā. By then, Indian colonies were also established in the archipelago, later to be known as Indonesia.

The Yüeh, the K'un-lun and Fu-nan

"According to unanimous Chinese opinion, the Yüeh were *the* seafarers [and shipbuilders] of China."[34] They were almost certainly in part responsible, along with the Fu-nanese, for the diffusion of decorated bronze drums through the islands of South East Asia from the middle of the first millennium B.C. (*supra* pp. 144–146). It has been suggested that they reached the Moluccas or at least somewhere in the eastern archipelago where cloves could be obtained and traded to the Former Han.[35]

Around the third century A.D. the Yüeh are joined in the records by the *K'un-lun*, evidently a larger fraternity of seafaring folk, fishermen, traders, and pirates, perhaps predominantly Malays or Indonesians, but including others of South East Asian provenance, from Burmans to Chams. They have been tentatively identified with the Man-i or 'barbarians' of the Annals of the Former Han.[36] *K'un-lun* was primarily an ethno-linguistic term, implying a "unity of culture,"[37] but was also used to refer to a region comprising the southern mainland and islands of South East Asia.[38] As such, it broadly corresponded to Sanskrit *Dvīpāntara*, indeed the two terms were offered as synonyms in a Chinese-Sanskrit lexicon of the seventh or eighth century.[39] Su Kung, a leading pharmacologist of the seventh century, believed that cloves came from *K'un-lun*,[40] which in the broadest sense was true.

As already remarked, the ships described in the Greek *Periplus* as *kolandiophōnta*, sailing between eastern India and South East Asia, are thought to correspond to the *k'un-lun-po* of Chinese sources (*supra* p. 144). The *K'un-lun* follow the Yüeh and, in company with Indian mariners, appear to dominate

the sea lanes leading to China from the west and south until the arrival of the Persians and Arabs in the middle T'ang (late seventh century).

Western luxuries reached the Han either overland through Central Asia (in return for silk), or by land and sea from the Roman Orient (*Ta-ch'in*), through the Persian Gulf, across or around India, and from there to the Kra Isthmus of the Malay peninsula and the Gulf of Thailand. Following the collapse of the Han, the Central Asian routes were periodically blocked, notably by the Hephthalites (White Huns) in the first half of the sixth century. Indonesian spices and resins came up from the south, and the two broad avenues of sea commerce met in Fu-nan.[41]

The territorial nucleus of Fu-nan lay in the valley of the lower Mekong; the outer frontiers fluctuated more or less continuously.[42] Chinese texts refer to a Hinduized state between the middle of the third century (when embassies were first exchanged) and the sixth century, when Fu-nan declined, to be replaced by *Chen-la* (Cambodia). Routes from the ports of Fu-nan led north to an adjacent Hinduized kingdom, Campā (*Lin-yi*, known from the late second century), and thence to the corridor of Annam-Chiao. Alternatively, goods might be shipped into the Gulf of Tongking and the city of Chiao-chih. For many centuries, Fu-nan and its Isthmian dependencies were a major source of perfumes, both of local origin[43] and imported. Their strategic importance, on a major trade route between India and China, waned from the late fifth or early sixth century with the greater use of the Strait of Malacca by shipping bound for southeastern Sumatra (Palembang–Jambi), from which there were passages to southern China.

When China was unified (under the Ch'in, Han, Sui, T'ang, Yüan, Ming), foreign luxuries doubtless found their way to all sizable centers of demand, however remote, but always most notably to the Imperial court. When China was divided, the southern dynasties benefited first and foremost, both from the products themselves and from receipt of import and re-export duties levied at the land frontiers and the ports. This was apparent when Wu (including Chiao) controlled the South at the time of the Three Kingdoms (220–265); again, under the Liu Sung in the middle of the fifth century; the Liang and Ch'en in the sixth century; the Southern Han at the time of the Five Dynasties (907–960); and, especially, under the Southern Sung (1127–1279), a dynasty that came to depend on overseas trade for much of its revenue. The capital lay at Hangzhou, south of the Yangtze.

Before the middle of the Sung (twelfth century), the Chinese presence abroad, apart from Annam, was insignificant, and maritime commerce was mainly conducted in foreign ships. Chou K'ü-feï (1178) believed that the wealthiest overseas lands lay far to the west under the control of the Arabs

(*Ta-shï*) and to the south in *Shö-p'o* (Java) and *San-fo-ts'i* (Palembang, Śrī Vijaya).[44] The southern, maritime orientation of the Sung continued for a while under the Ming, to reach a spectacular climax in the despatch of seven naval expeditions (1405–1433) to the West, three of which reached the shores of East Africa. Thereafter, both private and official overseas trade by Chinese nationals were prohibited, which naturally encouraged smuggling.[45]

The Moluccas, Banda, and Timor lay on the perimeter of the Chinese world. K'ang T'ai, one of the first Chinese envoys to Fu-nan in the middle of the third century, heard of *chi-shê* perfume, evidently cloves, from the *Ma-wu* islands,[46] a circumstantially possible reference to the Moluccas—assuming that the Funanese themselves knew the places of production at this very early date. The most ancient agreed name of the islands is *Wu-nu-ku*,[47] from the late twelfth or early thirteenth century, when perhaps the Chinese were first in direct touch with the Moluccas. *Tan-yü*, one of several "ocean islands," was possibly Ternate.[48] The Chinese transcription of Old Javanese *Maloko* (fourteenth century) is *Mi-lo-chü* or something similar.[49]

Chau Ju-kua (1178/ca. 1225) recorded that nutmegs "are brought [to China] from the foreign tribes in the depths of the islands of *Huang-ma-chu* and *Niu-lun*, dependencies of *Shö-p'o* (Java)"[50] and perhaps a disguised reference to the Banda group. Later transcriptions of Javanese *Waṇḍan* include *Wên-tan* (1349)[51] and *P'an-t'an* (1407).[52] Timor is *Ti-mon* or *Ti-wu* (1178/ca. 1225), also said to be dependencies of Java, and later *Ku-li Ti-mên* (1349) and *Ki-li Ti-mên* (1436).[53–55]

Aromata

Ancient China was matched only by India in its appetite for aromatic products, used chiefly in public and private ceremonies and in preventive and general medicine. The most conspicuous consumers were the Imperial court, households of the nobility and high officials, and monasteries and churches following the introduction of Buddhism and Nestorian Christianity (Map 4). "In T'ang (618–906)," wrote E. H. Schafer, "a man or woman of the upper classes lived in clouds of incense and mists of perfume."[56] Aromatics of South East Asian provenance were then at least as important as those brought from the Near East.[57]

'Fragrance' was among the words listed and defined in the *Shuo-wen*, the first comprehensive Chinese dictionary, presented to the throne A.D. 121.[58] Aromatics are well represented in Chi Han's *Southern Flora* of the early fourth century.[59] Among local products, pine resin was especially esteemed.[60] Materia medicas (*pên-ts'ao*) of all periods include many scented woods, herbs, flowers,

gums, seeds, and fruits. From at least the time of the Han, local spices were supplemented, at great expense, by imports from the West and the South. The early conquest of Annam, said to be "rich in perfumes,"[61] increased supplies, both by trade and tribute.[62] Aromatics invariably were reported among the products of overseas territories and were always welcome as items of tribute.[63] In 527 and 530, the king of *P'an-p'an* on the east coast of Malaya (Map 10) offered ten varieties of perfume.[64] Many contributions originated outside the territories of the donors.

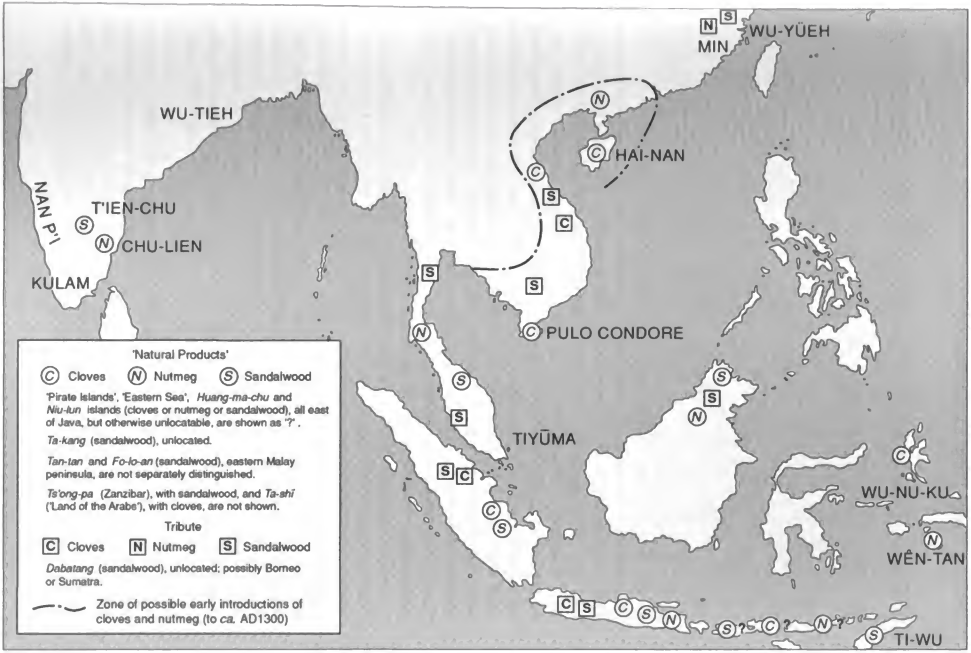
The range of desirable aromatics was gradually extended. Indian influence in South East Asia was important in this respect. The use or significantly greater use of sandalwood coincided with the advent of Buddhism. Tibet borrowed from both India and China. The "six good plants" or Plants from Heaven, known from the eighth century or earlier, were all aromatics of remote provenance—cloves, nutmeg, saffron, cardamom, camphor, and sandalwood.[65]

Familiarity with one spice led to the introduction and acceptance of something similar, possibly unknowingly, followed by confusion in folk nomenclature. The association of nutmeg and cardamom, and of cloves and cinnamon have already been remarked. A South East Asian pine-resin (*ju*) was traded to China, apparently as a kind of frankincense (*hsün-lu*) or as a satisfactory (and cheaper) substitute.[66] Likewise, Indonesian benzoin (*Styrax* spp.) was a substitute for myrrh (*Commiphora mukul*).[67] On the other hand, while camphors from three distinct botanical sources were known, the expensive product of the most remote areas (Borneo, Sumatra) remained, for no good pharmacological reason, the most prestigious.[68]

Clove

The earliest indication of some appreciation by the Chinese of the wealth of remoter South East Asia and of a connection, however tenuous, between China and eastern Indonesia is the use of cloves to sweeten the breath by courtiers under the Former Han (third century B.C.).[69] The same custom was reported by Chau Ju-kua (1178/ca. 1225).[70] Possibly, cloves were first brought to China by the Yüeh; later, supplies came up from Fu-nan and are mentioned by Chinese authors, notably pharmacologists, from the third century onward.[71] It is conceivable that attempts were made to introduce the tree (Map 11), but safer to assume that references to cloves as 'products' of Hai-nan,[72] Annam-Campā,[73] and southern Fu-nan (Pulo Condore) amount to misunderstandings or the conflation of places of production and areas of supply.

There is no evidence that the Chinese knew exactly where clove trees grew before the thirteenth century (*Wu-nu-ku*), possibly the fourteenth century (*Wên-*



MAP 11. Cloves, nutmeg, and sandalwood as "natural products" in Chinese sources before ca. 1350, and tribute in cloves, nutmeg, and sandalwood (or sandalwood products) to the Chinese court.

lao-ku). Li Hsün (ca. 900) referred to the Eastern Sea.[74] Chau Ju-kua has *San-fo-ts'i* (Palembang, Sumatra), *Shŏ-p'o* (Java), and even the Arab lands (*Ta-shï*).[75] Nearer the mark were his 'Pirate Islands,' dependencies of eastern Java.[76]

Map 11 shows the distribution of places, apart from *Ta-shï*, where, according to Chinese authors, cloves were 'produced' before the middle of the fourteenth century. With the exception of *Wên-lao-ku*, these were entrepôts and doubtless represent only a fraction of the places through which cloves passed en route to China. Also shown are the places whence cloves are said to have been sent as tribute to the Chinese court—Campā (1018), Java (ca. 1300), and Sumatra (1377),[77–79] again not producers but entrepôts.

We know from the official History of the Ming that the Chinese visited the Moluccas in the fourteenth and early fifteenth centuries.[80] They participated in the general trade in cloves at least a century or so earlier. Chau Ju-kua (1178/ca. 1225) records that merchants bartered for cloves and sandalwood at *San-fo-ts'i* and *Ki-lo Ta-nung* (? Kuala Terong, Perak, west coast of Malaya), and apparently took some to *Nan-p'i* (Malabar)[81] and to *Yang-man* (Oman).[82] Goods shipped to Orissa (*Wu-tieh*) in the middle of the fourteenth century and to Kūlam (*Hsiao Ko-lan)* in Malabar in the early fifteenth century included cloves and nutmegs.[83] "Merchants who...trade in the Western Ocean carry out with them such things as cloves, nutmegs,...musk, sappan-wood, blue and white porcelain-ware jars...and return with goods of ten times greater value" (1349).[84] From the middle to late thirteenth century, the Chinese were competing successfully with Indians and Arabs in the waters to the east of India and held the initiative until the early fifteenth century.

Chinese command of the seas off northern China dates from a much earlier period. Exactly when cloves were first taken to Japan is unknown. The *Shōsōin*, the great eighth-century repository of the Todaiji monastery in Nara, has a wooden *sūtra* case decorated with carved cloves (Figure 22);[85] also a collection of "rare drugs," 42 of the 60 deposited by the widowed Empress Komyo in 756, and a further 20, presumably gifts of other persons, which include cloves.[86] The great majority of the total must have been imported, almost certainly from either China or Korea. The earliest known reference to cloves is in Yasuyori Tamba's *Ishimpō*, a work on Sino-Japanese medicine dating from the tenth century. Here *ting-tzu-hsiang* are included in a prescription to perfume the mouth and the body, clothing and bed covers.[87]

Cloves were widely recommended and have an exceptionally long history of use in oral hygiene. Clove bark was prescribed for toothache from at least the period of Li Hsün (early tenth century).[88] The oil has been used for the same purpose into modern times. Cloves sometimes served as a condiment with meat or in the preparation of a marinating liquid,[89] but in general the culinary

Figure 22. *Sūtra* case, decorated with carved cloves, from the eighth-century *Shōsōin* (treasure warehouse) of Todaiji monastery, Nara, Japan. *Wood work objects in the Shōsō-in,* no. 105. Edited by the Office of the *Shōsō-in.* Tokyo, 1978.

uses were and remain small and esoteric. P. U. Unschuld has drawn attention to their inclusion "in a decoction in case of choking with food" (1596).[90]

Most varied were the applications in Chinese[91] and Tibetan medicine,[92] with a reputation as a carminative and anthemintic, in cases of nausea and vomiting, intestinal disorders generally, and even cholera. Cloves were believed to have restorative properties and were combined with other substances to make refreshing essences. It was chiefly as an aromatic and superior disinfectant that cloves were prized.

Nutmeg

The nutmeg may have been known to the Chinese by the fifth or sixth century;[93] it was first described in the first half of the eighth century.[94] However, there is a considerable risk of confusion with other species of *Myristica* (*supra* p. 12) and, perhaps more particularly, with any one of several kinds of cardamom (*supra* p. 22). The same holds true of reports of cultivation in southern China (Lingnan, Kwangtung) from the time of the early Sung (tenth or eleventh century).[95] Map 11 shows a possible zone of early introductions, including clove, nutmeg and sandalwood. Such an expression of Chinese interest in southern species deserves to be more fully investigated. The state of Min (Fukien) sent pepper and nutmegs as tribute to the northern empire in 941 and 943, but these, in E. H. Schafer's opinion, were "doubtless imports."[96]

Chinese knowledge of the home of the true nutmeg and of mace may be no earlier than the fourteenth century (*Wên-tan*, Banda, 1349).[97] Chou K'ü-fei (1178) thought that the natural products of *Shŏ-p'o* (Java) included nutmeg.[98] Chau Ju-kua names two unidentifiable islands in the vicinity of Java.[99] Ma Huan (1433) has *Chao-wa* (East Java),[100] and the History of the Ming, Borneo.[101] All were suppliers rather than producers. Even in the fifteenth century, the Chinese were fundamentally more interested in, and impressed by, the developed societies of the West—India and the heartland of the Islamic world, successor of the Roman Orient—than in the island kingdoms of the South. Prime evidence of this lies in the extraordinarily ambitious naval expeditions of the early Ming (1405–1433),[102] led by the Muslim Chêng Ho and in which Ma Huan, another Muslim, served as interpreter.

Chau Ju-kua described the nutmeg as warming.[103] It was occasionally used as a culinary spice. In Chinese and Tibetan medicine,[104] the grated nut is mentioned less frequently than the clove, but, as early as the T'ang, they both were prescribed for rather similar digestive disorders. Perhaps these costly 'Javanese' mendicaments were to some extent interchangeable.

Sandalwood

Sandalwood has long been prized throughout the East as a powerful, yet relatively inexpensive, aromatic of wide application. India was (and remains) the principal customer, and it was almost certainly through contact with Indianized societies and, more particularly, as a consequence of the eastward spread of Buddhism (Map 4), that China became an important market for this scented wood. As in the case of cloves and nutmeg, the Chinese were first supplied by foreigners. Only from the thirteenth or fourteenth century were merchants of Fukien and Kwangtung buying sandalwood directly in Timor.

Chau Ju-kua identified Timor. "*T'an-hsiang*," he wrote, "comes from the two centres of *Ta-kang* [an unlocated island] and *Ti-wu* [Timor]; it is also found [i.e., traded] in *San-fo-ts'i*" (Palembang, Sumatra).[105] In 1349, we read:

> [Timor] has no other rare product but sandalwood, which is very abundant, and which is bartered for [by the Chinese] with silver, iron, cups [of porcelain], cloth and coloured taffetas.[106]

Again in 1436: "[*Ki-li Ti-mên*] has luxuriant forests solely of sandalwood; it produces nothing else. There are twelve trading ports."[107]

Other places in South East Asia that reputedly produced sandalwood (Map 11) were most likely entrepôts, but just possibly sites where the species had been introduced. Among the latter, there was *Chao-wa* (East Java) with "san-

dalwood essence" (1433),[108] and perhaps *Chan-ch'öng* (Annam) where "foreign merchants trade in sandalwood" (ca. 1225).[109] On the other hand, *San-fo-ts'i*[110] and *Shö-p'o* (Java)[111] were probably among the ports or countries where sandalwood could be regularly obtained, rather than where it was produced. The situation in *Fo-la-an* (Beranang)[112] and *Tan-Tan*,[113] both on the Malay peninsula, is especially problematical.

A further possibility of error is the misinterpretation of the description sandalwood—that what is being reported is not *Santalum album* but scented *Pterocarpus indicus*, one of the red sandalwoods, present in Malaya, Indochina, and Indonesia.[114] Chi Han's fourth-century *Flora* of southernmost China and Annam refers to neither *Santalum* nor *Pterocarpus*.

From at least the time of the T'ang, the Chinese believed that India was a source of sandalwood.[115] Chau Ju-kua in the early thirteenth century specifically mentions *T'ien-chu*, southern and central India.[116] At the same time, he recorded that sandalwood and cloves were shipped to *Nan-p'i* (Malabar) by way of *San-fo-ts'i* in Sumatra,[117] apparently in Chinese vessels. More surprising is Chau's observation that yellow sandalwood was produced in *Ts'öng-pa* (Zanzibar).[118] Given the Indonesian connection with East Africa, an introduction is possible; more likely, however, the reference is to red sandalwood, which is noted as a native product of Zanzibar by Wang Ta-yüan (1349).[119] The term *cĕndana janggi*, sandal of *Zang* (Zanzibar), was used in Malaysia in modern times.[120]

Sandalwood sent in tribute to the Imperial court (Map 11) almost certainly originated in Timor, but officially it came from a number of other places. Fu-nan in 519 offered an 'image' carved in sandalwood,[121] and Wu-Yüeh (Che-chiang and Fu-chien) in 976 "beds of camphor wood and sandalwood."[122] Both woods were reputed to repel bugs and insects. In the main, tribute appears to have been delivered in the form of billets of sandalwood—from the northern Malay peninsula (*P'an-P'an*, 527), *Dabatang* (647, Indonesian, but otherwise unidentified), the west coast of Borneo (*P'o-ni*, "three trays of sandalwood" 977), *Campā* and Java (992), and Pahang (*P'eng-heng*, 1416).[123–128] We know from the Arabs that *Kalāh* on the west coast of Malaya was a center of commerce in sandalwood.[129]

In China, as in India, sandalwood was primarily valued as an aromatic: "pure and strong and apt to evaporate; in burning it surpasses all other incenses" (ca. 1225).[130] 'Joss sticks' made of compressed sawdust were burnt on countless house altars and in public ceremonies, temples, and monasteries. In the early eighteenth century, Timor sandalwood was said to be "a great commodity in China."[131] Most highly appreciated was so-called Tibetan incense:

> ...composed of garoo wood (*Aquilaria agallocha*), sandalwood, and sappan wood (*Caesalpinia sappan*). At the end of each year, it is burned in the homes of

> noble families throughout the night so that its fragrance fills the nostrils, reaching to the points of the eaves and corners of the rooms. Truly it is an aristocrat among incenses.[132]

Sandalwood boxes to hold personal treasures were generally popular, first in the East and later throughout the world. In Japan, the *Shōsōin* of Todaiji monastery has a sandalwood (*byakundan*) dedication box and lid, presumably of the eighth century.[133] Valuable paintings were rolled in sandalwood cylinders.[134] Images of Buddha carved in this fine-grained wood date from the early T'ang.

Medical prescriptions and cosmetic preparations that include sandalwood usually can be traced to Indian practice. In Ch'en Chia-mo's *Pen-ts'ao* of 1565, genuine *t'an hsiang* is said to be "very aggressive and must [therefore] be thickly wrapped in paper" to prevent decay and loss of aroma.[135] It was regarded as a cooling substance, and skin disorders and excessive perspiration were treated with the powder and the distilled oil. Like clove and nutmeg, and probably aromatics generally, decoctions were prescribed as carminatives and stomachics. The oil was a sovereign remedy for muscular pains and a means of promoting physical well-being. In Tibetan medicine, sandalwood is one of "the six good plants" and used in inhalents and gargles and in a variety of medicaments[136] that were borrowed from either India or China.

INDONESIA

Indonesian (Javanese) texts date from the fourteenth century; in particular, we profit from the long panegyrical poem, the *Nāgara-Kēṛtāgama* by Rakawi Prapañca of Majapahit, A.D. 1365.[137] Majapahit (1293–1520) was the last of the pre-European island kingdoms or empires that succeeded one another over a period of 1000 years. The Malay Annals, *Sējarah Mēlayu* (Descent of Kings), cover a little less than 400 years and were completed in 1612.[138] Before the late thirteenth or early fourteenth century, Indonesia is solely portrayed in the writings of Chinese and Indian (Sanskrit) scholars. The early toponyms are often difficult to locate.

Before Śrī Vijaya

One of the earliest regional names is *Ko-ying* (Map 9), which probably lay in eastern Sumatra or western Java.[139] In the third century it appears to have been an eastern terminus for Indian shipping and an entrepôt for luxury goods moving through the archipelago, including, presumably, camphor from Suma-

tra, Borneo, and Malaya and the spices and sandalwood of eastern Indonesia. Contact with Fu-nan can be assumed. Both Fu-nan and *Ko-ying* had commercial relations with northwestern India and adjacent parts of Central Asia,[140] as well as with ports along the east coast of India. In the first three or four centuries of the Christian era, Hinduism and the Indian market for aromatics were the dominant external forces.

Ko-ying—if the Sumatran location is correct—was replaced, historically and geographically, by *Kan-t'o-li*[141] some time in the late fourth or early fifth century, and *Kan-t'o-li*, in turn, by Śrī Vijaya in the second half of the seventh century. *Kan-t'o-li* was the most prominent of a number of small kingdoms (Map 10)[142] that preceded the rise of Śrī Vijaya and stretched from the northern Malay peninsula (*P'an-P'an*) to east-central Java (*P'o-li*). These regional powers, contemporaneous with Fu-nan, were known to the Chinese chiefly because they sent missions with tribute to the Imperial court, commencing with *Ho-lo-tan* in 430 (the earliest, albeit circumstantial, evidence of a voyage from Indonesia to China) and *Kan-t'o-li* between 441 and 563.[143] The regional kingdoms flanked what became known as the Strait of Malacca and thereby controlled the all-sea route from India to Fu-nan (alternatively, goods were carried across the Kra Isthmus, the neck of the Malay peninsula). The whole of this politically fragmented and by now heavily Hinduized zone fell within what the Indians called *Suvarṇabhūmi* or *Suvarṇadvīpa* and *Dvīpāntara*, more specifically *Malayadvīpa* (Sumatra) and *Yāvadvīpa* (Java). By the fifth century, however, there was also an Indonesia-China connection, both political and commercial, of which the missions and embassies are the chief witnesses.

Indonesian traders handled local aromatics, pine resins, and benzoin; also dragon's blood (*Daemonorhops* spp.), gharuwood (*Aquilaria* spp.), high-quality (*Dryobalanops* spp.) camphor, cloves, nutmegs, and sandalwood. The Chinese and Indians probably already knew *Cinnamomum* camphor; cloves were associated or confused with cinnamon itself and nutmegs with cardamoms—all of which furthered the processes of acceptance and encouraged demand.

Śrī Vijaya

Śrī Vijaya (with a capital of the same name, which the Chinese called San-fo-ts'i, in or near the present Palembang) was an important center of Mahāyāna Buddhism. The kingdom began to expand, ultimately to form the first Indonesian empire, in the late seventh century.[144] Competition with neighboring kingdoms, initially of similar rank, turned in part on control of the spice trade, with principal markets outside Indonesia, and the related internal trade in foodstuffs.

China was unified under the T'ang from 618. The capital, Ch'ang-an or Loyang, lay in the North, but demand for products of the South increased. A Chinese mission to Śrī Vijaya in 683[145] (250 years after the first Indonesian mission to China) is an indication of the kingdom's growing importance and territorial ambitions. Malāyu-Jambi to the northwest of Śrī Vijaya and port territories on both sides of the Strait of Malacca were prime targets. By the end of the century, Śrī Vijaya was in control of this vital seaway, and the old emporium of *Kalāh* on the west coast of the Malay peninsula was a dependency.

In the course of the eighth century, the ruler of Śrī Vijaya, the Mahārāja of the Arabs, came to exercise jurisdiction over the southern half of the Malay peninsula, as well as the commercially more active eastern half of Sumatra, and probably a section of the northern coast of Java. The latter brought Śrī Vijaya into territorial contact with Kaḍiri, the principal Javanese kingdom between ca. 1045 and 1222. The seventh or eighth century also saw Persian and Arab merchants in Indonesian waters for the first time, the majority en route to China. The lifespan of Śrī Vijaya more or less coincided with the period of maximum Arab trading activity. Like the Indians before them, the Arabs were content to obtain the products of eastern Indonesia at convenient entrepôts, notably at first Palembang.

Śrī Vijaya was the principal political and commercial force in western and central Indonesia for approximately three centuries, the eighth to the tenth inclusive. The empire controlled the shortest all-sea passage between the West and China, as well as the final stage of the route between the Spice Islands and the Strait of Malacca (Map 10). The two routes met, although not most conveniently, at Palembang, where there was an Arab colony from the beginning of the eighth century.

Java: Kaḍiri, Singhasāri, Majapahit

The decline of Śrī Vijaya began in the eleventh century. The rival kingdom of Kaḍiri, based in central and eastern Java and served by the port of Tuban on the Java Sea, emerged about the middle of the century. It sent an embassy to China in 1109.[146] Although less celebrated than Śrī Vijaya, Kaḍiri exercised some measure of control as far east as the Moluccas[147]—an advantage denied to Śrī Vijaya but claimed by all later Javanese empires. Also around the middle of the eleventh century, Arab sea merchants on their way to China began to bypass Palembang, turning north toward Hai-nan and *Khanfu* (Canton) after rounding the southern tip of the Malay peninsula, sometimes calling at Tiyūma island (Map 11). Here or at one or other of the old Strait ports, sandalwood and East Indonesian spices, as well as Malayan camphor, could be obtained.

The former products also were available in the ports of East Java. The principal port for camphor was Barus-Fanṣūr on the northwest coast of Sumatra (Map 10), far from Palembang.

Another underlying reason for the decline of Śrī Vijaya was the expansion of the Chinese merchant marine under the outward-looking Southern Sung (1127–1279).[148] From the second half of the twelfth century, Chinese traders regularly sailed to South East Asian centers of production,[149] and there was a growing tendency to avoid the restrictions imposed and the duties levied by Palembang. In 1157, Malāyu-Jambi, which had earlier been absorbed by Śrī Vijaya, independently offered tribute, including sandalwood,[150] at the Chinese court.

From the middle of the twelfth century, one or other of the Javanese empires was the leading trading power in the archipelago,[151] organizing the exchange of the rice of central Java for the spices and sandalwood of the eastern islands. Javanese and Balinese cottons and the calicoes and finer products of India, shipped by Gujarātīs,[152] also were in generally high demand. Chinese sea-mindedness lasted through the Yüan (1279–1368) and into the Ming until the return in 1433 of what proved to be the last of the state-sponsored maritime expeditions, when overseas trade, both official and private, was prohibited. Clandestine operations undoubtedly continued,[153] but in any event the Malays and Javanese were never dislodged. They played a crucial role from the time when East Indonesian products first appeared on world markets—before the beginning of the Christian era—until the arrival of Europeans in the Spice Islands. Even then, local trade in cloves, nutmeg, and sandalwood by no means ceased.

Kaḍiri was succeeded by Singhasāri (ca. 1222–1292) and Singhasāri by the last and best known of the Javanese empires, Majapahit (ca. 1294–1520).[154] Suzerainty extended as far as the Moluccas,[155] which lay on the eastern perimeter of what the Javanese called *Nusantara,* the archipelago or 'outer islands.' The capitals of Kaḍiri and of successor empires stood in fairly close proximity at the eastern end of Java (Map 10). On the adjacent north coast were the ports that handled the trade in spices: from west to east, Dĕmak-Japara, Tuban, Grĕsik—"the jewel of Java in trading ports"[156] at the beginning of the sixteenth century—Surabaya, Pasuruhan, collectively about half way between the Moluccas and the Strait of Malacca and, after ca. 1400, Malacca itself.

Regional Trade

Indian and Arab traders arrived in East Java on the westerly monsoon (from December) and returned on the easterly (from May). The Javanese voyaged in

complementary fashion to and from Banda and the Moluccas. Consequently there were two circulatory and interdependent trading systems that converged on the ports of East Java. Merchants of Tuban had a colony on Hitu (northern Ambon) and sailed chiefly to Port Neira in the Banda Islands where cloves as well as nutmegs could be obtained.[157]

Notable among the westerners in the fifteenth century were Muslim Gujarātīs and Bengalis and Hindu Chettyars from Coromandel.[158] Gujarātī vessels first appeared in the late twelfth century. Until the founding of Malacca (ca. 1400), they approached northern and eastern Java by way of the Sunda Strait.[159] Thereafter, Malacca—with up to 1,000 Gujarātī merchants and 4,000 to 5,000 seamen—was their principal rendezvous. Shortly before the arrival of the Portuguese (1511), they were shipping as much as 4,000 *bahars* of cloves in a single (monsoon) season.[160] "Malacca cannot live without Cambay, nor Cambay without Malacca if they are to be very rich and very prosperous," wrote Tomé Pires about 1515.[161] Some Gujarātī ships were larger than Portuguese *naus*[162] and brought merchants from many parts of western Asia—Arabs, Armenians, Turkomans, Abyssinians, Persians—and from the coastal cities of East Africa. By the middle of the fifteenth century, Malacca was the most cosmopolitan of East Asian cities and the hub of the trade in East Indian commodities, with connections extending from Canton to Aden.[163] Ludovico Varthema (ca. 1505)

> believe[d] that more ships arrive[d] in *Melacha* than in any other place in the world, and especially there come here all sorts of spices and an immense quantity of other merchandise.[164]

The port was then at the height of its reputation. In the two or three decades following the Portuguese conquest (1511), however, the majority of Muslim and Chinese merchants withdrew from Malacca and operated out of Aceh and Bantam and other, smaller havens.

More significantly in the long run, there arrived from the west in the course of the thirteenth to fifteenth centuries, not only traders, but the faith of Islam. Indian Muslims contributed significantly to the conversion of the islanders.[165] The sultanates of Ternate and Tidore date from the late 1470s, thereby for the first time uniting the Moluccas with the larger world of Asia.

To the medieval West, the name Java was synonymous with spices. Marco Polo (1292–1295) was referring to East Java near the beginning of the Majapahit period when he wrote:

> [Java] is of surpassing wealth, producing black pepper, nutmegs, spikenard, galingale, cubebs, cloves and all other kinds of spices. This island is also frequented by a vast amount of shipping and by merchants who buy and sell

> costly goods from which they reap great profit. Indeed, the treasure of this island is so great as to be past telling.[166]

Polo almost certainly never visited Java and, whether knowingly or not, he referred to what could be obtained there, such as cloves and nutmegs, not necessarily to what was locally produced.

Majapahit is the first Javanese empire for which we have a native record. The *Nāgara-Kĕrtāgama* (1365) refers to Banda (*Waṇḍan*), Ambon (*Ambwan*), *Maloko* and *Timur*,[167] to the activities of foreign merchants, and to the annual fair of Majapahit in the month of *Phālguna* (February–March).[168]

> The last two lines of stanza 3 [Canto XV] mention the Majapahit Court's care for the collecting of merchandise that was to be stocked, either for international trade or for home consumption. The Javanese ecclesiastical officers and mandarins of Canto XV–3–4 might be considered as traders with a Royal patent (as appears from their Court titles). Their stock in trade consisted chiefly of spices from the other islands of the Archipelago.[169]

The Javanese at this time were by far the most important of the Indonesian merchants, but they were not alone. The Bandanese, unlike the Moluccans, had deep-sea vessels and sometimes voyaged as far as Malacca.[170] António de Brito (1523) found Bandanese *jumcos* at Grĕsik, East Java.[171] Duarte Barbosa (ca. 1518) tells of men of Sulawesi who, in "badly built boats," traded in spices and other commodities.[172] Antonio Pigafetta in Timor in 1522 encountered a "junk of *Lozzon* [Luzon] which had come to [load] sandalwood."[173] These and other local specialities, such as tortoise (turtle) shell,[174] animal skins, birds of paradise (*aureas aves*) feathers[175] and live parrots passed through the hands of innumerable merchants and thereby worked their way up the hierarchy of demand. The parrots (*noyras, lories*) of the East Indies[176]—the Moluccas in particular—were almost as celebrated as the spices, known in medieval India,[177] taken in tribute at the Chinese court,[178] and added to the tall tales told by the Arabs.[179] A demand for brilliant feathers may have prompted the first trading ventures between the Moluccas and New Guinea and the rest of South East Asia.[180]

The Chinese, unlike the Indians and Arabs, challenged the Javanese in Moluccan waters in the course of the fourteenth and early fifteenth centuries. They settled in several east Javanese ports and reputedly founded the port of Grĕsik (*Ssŭ-ts'un* or *Ko-erh-hsi*) in the second half of the fourteenth century.[181] Grĕsik (*Agracii*) also became a port-of-call of the Gujarātīs[182] and the ties with Malacca were particularly close. However, a combination of Javanese experience and superior location and, from the middle of the fifteenth century, official Chinese disapproval of overseas trade of all kinds, meant that Sino-Javanese competition in Moluccan waters effectively ceased.[183]

The comparatively brief Chinese intervention, little more than a century, was the basis of the tradition, picked up and repeated by Europeans, that the Chinese were early, even the first traders in the Moluccas.[184] In fact, they only arrived some time in the late thirteenth or early fourteenth century and appear never to have visited Banda. Chinese copper cash (Portuguese *caxas, caixas*) long continued to circulate,[185] but the rising demand for cloves and nutmeg in the West in the mid- to late fifteenth century was met, in the first instance, as in earlier times, by Malays and Javanese.[186] On the other hand, the long-established Chinese trade with Timor and Solor survived both Javanese competition and Portuguese intervention in the sixteenth century. As India depended more on its own sandalwood, China became the leading market. Supplies entered chiefly by way of the Sino-Portuguese trading post of Macao.[187]

Trade within Indonesia was by barter, apart from the use of Chinese currency. In the case of Banda and the Moluccas, spices were exchanged for foodstuffs and textiles, and a variety of other goods—iron- and copperware, ivory, cinnabar, quicksilver, mirrors, and beads—shipped from Java and farther afield. Pigafetta (1521–1522) provides the first eye-witness description.[188] The Spice Islands were notoriously deficient in foodstuffs. Rice, in particular, was imported, although sago was the basic item of diet for the majority of the population and was "used for money in the country [Banda] (ca. 1515)."[189]

Medieval Arab authors describe, or rather report at second-hand, 'dumb trading' for cloves (*supra* p. 89), but the participants are never clearly identified. The procedure can scarcely have extended beyond the first of a chain of transactions, probably chiefly involving primary producers and Javanese merchants or their agents. Much more attractive to merchants, of whatever origin, were the stockpiles accumulated by rulers and nobles, who demanded cloves in tribute and worked their plantations with bondsmen or slaves.[190] This was usual when Europeans first arrived and probably had long been customary.

Merchants from western and southern Asia, notably Arabs, Gujarātīs, and Bengalis, continued to sail to the ports of East Java and of neighboring islands through the sixteenth and early decades of the seventeenth centuries. The Venetian Cesare Fedrici, who traveled as far as Banda in the 1560s, reported that the Portuguese government in Malacca despatched a ship each year to the Moluccas (for cloves) and another to Banda (for nutmegs and mace), all for the benefit of the Crown. He added (in Richard Hakluyt's translation):

> There goe [also] small shippes of the Moores [Muslims] thither, which come from the coast of Java and change or guild their commodities in the kingdom of *Assa* [Aseh, Sumatra] and these be the maces, cloves and nutmegs which go to the streights of Mecca.[191]

Official trading ventures from Malacca to the Moluccas and Banda proved to be expensive, or rather made little profit. The royal monopoly (1522–1539) was in practice unworkable. Individual entrepreneurs, employing Malay or Javanese crews and even hiring local ships, were more successful.[192] Some, rather paradoxically, enjoyed special privileges (*liberdades*) or grants (*foros*) issued by the Crown. After 1539, trade was open to all, on condition that one-third of all cargoes was offered for sale to the Crown at cost price.[193] In general, the Portuguese had only a small effect on the production of cloves and nutmeg,[194] but their intervention in the market forced up prices.[195] The volume of trade handled by the Javanese, as far west as Malacca, apparently increased in the course of the sixteenth century.[196] In 1609, Bartolomé Leonardo de Argensola in the *Conquista de las Islas Malucas* put them in the forefront of the clove trade, their cargoes being sold to Arabs and Persians who, in turn, looked to markets in western Asia and around the Mediterranean.[197]

The 'Moors' and Indians only begin to disappear with the arrival of the Dutch at the close of the sixteenth century and the implementation of a much more radical policy of exploitation. The first Dutch expedition to South East Asia left Amsterdam in April 1595. A convoy that sailed in 1598 returned the following year with 600,000 pounds of spices and other East Indian products. The United East India Company (*Verenigde Oostindische Compagnie*[198]) took Amboina in 1605, Banda in 1609, and by 1620 had seized or concluded alliances (*contracten*)[199] with virtually all the principal producers of cloves and nutmeg. While the English East India Company, founded in 1600, shipped substantial quantities of cloves up to the early 1620s, nutmegs and mace were mostly bought in Holland.[200] Portuguese Malacca fell to the Dutch in 1641. The next step was to concentrate plantation production on Ambon (cloves) and Banda (nutmegs) (Figures 23 and 24) and then—notably from 1652 by the Treaty of Batavia—to attempt to destroy (*extirpatie*) trees on all other islands,[201] if necessary granting pensions to rulers by way of compensation (*recognitie penningen*). The aim was to avoid overproduction (Ambon alone could comfortably meet the world demand for cloves) and to dominate the major spice markets of Europe, India, and China. The effect was seriously to disrupt ancient patterns of trade and exchange and to depopulate the whole or large parts of many islands, notably Banda. The English traveller John Fryer (1672–1681) observed that "the Dutch will leave nothing unattempted, to engross; for none has escaped them but this pepper [of Malabar]; cinnamon, cloves, mace and nutmegs being wholly theirs...."[202] Even by 1614, according to a report to the East India Company in London, they were regarded as "worse enemies than the *Portingals* in matters of trade."[203]

Throughout eastern Indonesia the focus of exploitation by Europeans was the factory—Portuguese (*feitoria*), Spanish, and English, as well as Dutch

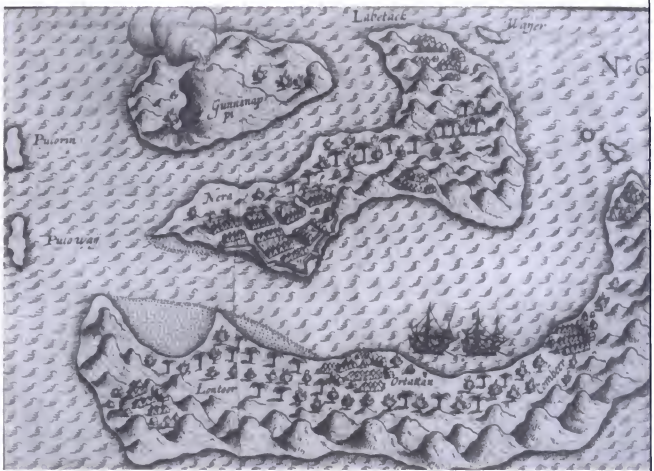


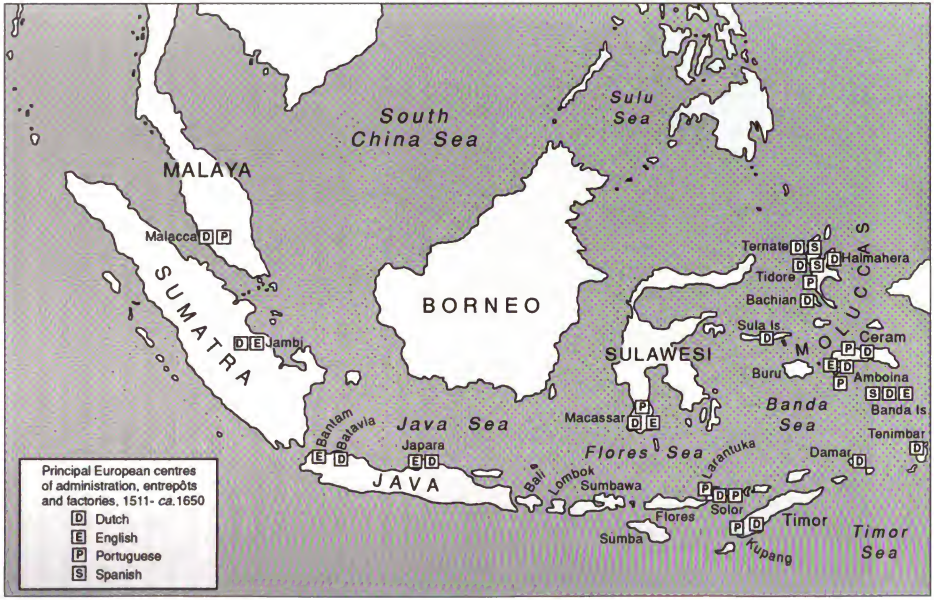
Figure 23. The Banda Islands. J. Corneliszoon van Neck, *Le Second Livre, journal ou comptoir....*1601.

(Map 12).[204] Makassar, Bantam, Batavia, and, above all, Malacca were the principal entrepôts and nodes of administration. All communications were by sea. Some factories and towns changed hands several times.

Trade by Europeans between different parts of South and East Asia[205] was often more profitable than supplying the home countries. In the 1530s, the Portuguese shipped substantially more cloves, nutmegs, and mace to India and Hormuz than to Portugal. The buyers in Hormuz were "Moorish merchants who pass[ed] it on, over Persia, Arabia and all Asia as far as Turkey."[206] From at least the early seventeenth century, the same products were taken to Bengal by the Portuguese and the Dutch.[207] English merchants found that they sold "exceeding well in Surratt" and other Indian and Persian stations.[208] The Dutch between 1620 and 1740 marketed one-third or more of their spices, notably cloves, in Asia: Persia, Arabia, and India.[209] Japan was served by the Portuguese from Macao[210] and later by the Dutch,[211] but the demand for cloves and spices generally was said in the early seventeenth century to be relatively small and prices were consequently low.[212]

Figure 24. Collecting and weighing nutmegs and mace at the Dutch factory (*loge*) on *Nera* (Neira), Banda Islands. J. Corneliszoon van Neck, *Le Second Livre, journal ou comptoir....*1601.

Indonesian traders were left, at best, with domestic demand, and where and when opportunity arose undercut Europeans in the remoter Asiatic markets. Such trade is widely, if adventitiously, reported. In the late sixteenth century, ships of *Syan* (Siam) and *Burneo* (Borneo) brought cloves, nutmeg, pepper, and sandalwood to Malacca.[213] Sebastien Manrique (ca. 1630) observed that all the Moluccan spices were on sale in Arakan, Burma.[214] Makassar from the beginning of the seventeenth century until 1667–1669, when it was taken by the Dutch, served as a transit port for more or less clandestine shipments of spices, especially mace and cloves.[215] "Junks trade[d] from [Makassar] to Banda, so that a small quantity of mace and nutmegs [was] there to be had" (1609).[216] John Jourdain, who established the English factory (1613), reported that rice and gold (from Johore) were annually bartered in the Moluccas and Banda for cloves, nutmeg, mace, and sandalwood.[217] A few decades later, cloves were known be available in Makassar "in spite of Dutch regulations."[218] One reason for the survival of interinsular trade in spices was the inability or unwillingness of the Europeans always to vouchsafe essential foodstuffs in return. Peter



MAP 12. South East Asia 1511–ca. 1650.

Floris (ca. 1613) witnessed the arrival in Patani, Thailand, of a junk belonging to a local merchant, Raja Indra Muda. This had sailed to Makassar and thence to Banda and there acquired mace and cloves in return for rice, which the Dutch 'castle' had been unable to supply.[219] Such cargoes by their very nature were almost wholly unrecorded. Collectively and over time, however, the quantities shipped were probably substantial.

Use of Clove, Nutmeg, and Sandalwood

Use of the Moluccan spices and sandalwood in Malaya and Indonesia now generally follows Indian or Chinese custom, and it is difficult to detect what is indigenous. The Javanese had a cult or god known as *Haricandana* (yellow sandalwood), unknown in India. Buddhist images were carved in sandalwood. Since the species was sufficiently common in Timor to be cut for firewood,[220] the pungent aroma must have been familiar from time immemorial. Its employment in domestic or public ritual presumably antedates the successful introduction of the species to India.

Malays use powdered sandalwood or sandalwood oil in steam baths, in ritual fumigation before prayers, and for the purpose of purifying corpses.[221] Pastes, emulsions, and oil of sandalwood are employed in cosmetics and in medicine both internal and external,[222] chiefly as a cooling agent for fevers and inflammation and to treat various intestinal afflictions.

It is usually said that cloves and nutmeg were put to no use by native inhabitants of the Moluccas and Banda, whatever the situation in western Indonesia. This is at least questionable. *Giroso*, recorded from the middle of the sixteenth century, was a local name for the ripe fruit of the clove.[223] In Banda, the custom of crushing nutmegs and mace to obtain a scented fat or 'butter'[224] is possibly aboriginal. Likewise, in the Moluccas, the addition of cloves to "ointments"[225] may antedate the arrival of Europeans. The mascatory betel leaf and areca nut were flavored with cloves or nutmeg-mace. This was remarked by I-Tsing in the seventh century[226] and first reported from *Maluku* by António Galvão (ca. 1544), who added "and they make no other use of [nutmeg and mace]."[227] Camphor was used in the same way.[228] The domestication of *Piper betle* and *Areca catechu*, and the origin of the custom of chewing a combination of the two, appear to belong to South East Asia.[229] It is problematical whether any of the medical uses of clove and nutmeg in South East Asia[230] originated there. The relevant prescriptions in Malay medicine appear to have Indian or Chinese antecedants. A concoction flavored with nutmeg and mace (*bunga papa* and *buan pala*) and used in childbirth may be an exception.[231]

Notes

1 Bellwood, 1997a: pp. 99 (Figure 4. 2), 101–105, 118–119, 123.
2 Bellwood, 1997b: p. 22. See also Horridge, 1986: p. 4.
3 Ellen and Glover, 1974: p. 353 and Figure 15. See also Solheim, 1964: pp. 360, 376–384, 400–403.
4 Harrison, 1954: p. 10 (eastern Borneo, western Java, southern Sumatra); Bellwood, 1997b: p. 275 (southern Sumatra).
5 Yazdani and Bynion, 1930–1955: 2: p. 42. Cf. Schlingloff, 1988: p. 207 (pp. 208–209, a bibliography of works on ships and shipping in ancient India); Deloche, 1996: p. 205.
6 Manguin, 1980: p. 274.
7 Christie, 1954: pp. 291–292, 1957: pp. 345–353; Wheatley, 1983: p. 271. Hornell (1920: p. 216), in attempting to explain the name *kolandiophōnta*, drew attention to Tamil *kūlan* or *kula*, "a large outrigger fishing canoe."
8 *K'un-lun* alone is mentioned much earlier, from the middle of the first millennium B.C., as the name of a western mountain and of an island in the Southern Sea; later of island and seafaring populations on the southern and western margins of the Chinese world. *Po* is not included in Han lexicons of the second century (Lo, 1970: p. 168) and is probably of South East Asian origin (? *p'a, p'ak*). Manguin (1960: pp. 272–276) thought that the *k'un-lun-po* resembled the sixteenth-century *jong* of Burma and Indonesia (without outriggers), rather than the Chinese *junk*.
9 I-Tsing (trans. J. Takakusu) 1896: p. xxx (a local "king's ship" between Palembang and Malâyu, thence to the north coast of Sumatra and eastern India).
10 Lévi and Chavannes, 1916: p. 49.
11 Lo Hsiang-lin, 1967: pp. 110–114 (Yüeh); Eberhard, 1968: pp. 366–369; Pirazzoli-T'Serstevens, 1979: pp. 125–136 (Dian culture, second–third centuries B.C.); Spennemann, 1984: pp. 137–143, 1987: pp. 71–75; Bernet Kempers, 1988: pp. 143–163.
12 Bernet Kempers, 1988: p. 244.
13 Heekeren, 1958: pp. 13–18; Sørensen, 1990: pp. 195–200. Lists of Heger I type drums and distribution maps in R. B. Smith and W. Watson (eds.) 1979: appendix II, pp. 510–515, and Bernet Kempers, 1988: pp. 219–223, and maps 1 and 2.
14 Bernet Kempers, 1959: p. 29, 1988: pp. 247–248.
15 Heine-Geldern, 1947: p. 169; Heekeren, 1958: p. 24.
16 Heine-Geldern, 1947: p. 169; Heekeren, 1958: p. 25; Bernet Kempers, 1988: pp. 277–278.

17 Heine-Geldern, 1947: p. 174; Heekeren, 1958: p. 26.
18 Bernet Kempers, 1988: pp. 143, 145–152 (152–153, ships on other bronze objects), and Figure 9.
19 Eberhard, 1968: p. 368. See also ibid: pp. 398–399, on gods and goddesses of Yüeh seafarers; for 'boat symbolism' in Insular South East Asia, see Manguin, 1986: pp.187–207.
20 Matsuomotu, 1968: pp. 30–31. Matsuomotu suggests that the mainland outrigger developed from the double canoe.
21 See Nooteboom, 1932; Sopher, 1965: pp. 194–195 ("an island invention"); Johnstone, 1980: p. 214. Hornell ([1946] 1970: p. 265) appears to have been the first to propose an origin among the river craft of the Burma and Indochina region. Horridge (1978: p. 4) associated the spread of Austronesian-speaking people with the distribution of the outrigger canoe.
22 Hornell, 1920: pp. 148–149, 157, 178, 183–184, [1946] 1970: pp. 253–271; Hornell and Haddon, 1936–1938: 2: p. 334, 3: pp. 15–40; Nooteboom, 1932: p. 220 (map).
23 Wells (1933: p. 308) has a photograph of what could be an outrigger on the banks of the upper Huang Ho.
24 Horridge, 1978: p. 4.
25 On Borobudur, see N. J. Krom [and T. van Erp] 2 vols. of text and 3 vols. of plates, 1927; also works in Manguin, 1980: p. 273 n. 10.
26 Mookerji [second ed.] 1957: pp. 31–32, and captions to illustrations. Basham (1949: p. 66) only claimed that the greater Borobudur ships "resembled those of India," but even this is very doubtful and impossible to demonstrate. On the disappearance of the large Javanese *jong* (< *junk*) by ca. 1600/1650, see Reid, 1990: p. 4, Manguin, 1993: pp. 197–213.
27 François Valentijn [1685–1714] 1724–1726:1 (ii): p. 207; Hornell [1946] 1970: pp. 74–76, 199, 205–210, 213, 282 (the modern version is "by far the most beautiful vessel to be seen in Eastern seas").
28 On the origin of the name *kora-kora*, see Santa Maria, 1967: pp. 88–89; Yule and Burnell *Hobson-Jobson* [1886] 1985: p. 159; Wilkinson, 1932: 1: pp. 627–628. The *kora-kora* itself has attracted attention from at least the time of Gabriel Rebello [1561–1569], in A. B. de Sá (ed.) 1954–1958: 3: pp. 381–386. See Paulus *et al.*, 1917–1939: V: p. 115; Hornell [1946] 1970: pp. 259, 267; Horridge, 1985: pp. 4–5.
29 Forrest, 1779: p. 19. By the time Forrest arrived in Sulu, one prow had departed and the cargo of the other had been purchased.
30 Forrest, 1779: pp. 152–153.
31 Alcina [1668] 1974: pp. xl, lxxvi [pl. 18]; Dampier [1686] (ed. J. Masefield) 1906: 1: pp. 342–343; Horridge, 1986: p. 53 (Figure 23, Sulawesi).

32 Aurousseau, 1923: pp. 137–264.
33 Li (ed. and trans.) 1979.
34 Eberhard, 1968: pp. 397–398.
35 Wheatley, 1959: p. 45 (quoting G. Gibson-Hill; in fact, I understand from Professor Wheatley [8. 4. 1998] that Gibson-Hill, then editor of the *Journal of the Malayan Branch of the Royal Asiatic Society,* added this "information" without the author's knowledge).
36 Wheatley, 1957: p. 116, 1983: p. 270.
37 Coedès, 1968: p. 9.
38 Ferrand, 1919: pp. 239–333, especially 289–333; Coedès, 1968: p. 9.
39 Lévi, 1931: pp. 621–627; C. Bagchi (ed. and trans. *Deux Lexiques Sanskrit-Chinois*) 1926–1937: 1: p. 287 [867], 2: pp. 348–349 (*Jipâttala = Nipâttala = Dipâttala = Dvipatala*).
40 Wang Gungwu, 1958: p. 111 n. 97 (*Pen Ts'ao Kang Mu*).
41 Pelliot, 1903: pp. 248–303; Coedès, 1968: pp. 36 ff; Hall, 1982: pp. 81–106.
42 Wheatley, 1983: pp. 150–151 n. 5.
43 Wheatley, 1961: pp. 18 (*Tun-sun*, dried scented flowers), 28 (*Ch'ih-t'u*, scented oils), 288 (Fu-nan generally).
44 Quoted by F. Hirth and W. W. Rockhill (trans.) Chau Ju-kua [ca. 1225] 1911: p. 23; also Chang T'ien-tse, 1934: p. 21.
45 Chan Cheung, 1967: pp. 223–227.
46 Wolters, 1967: p. 39.
47 Ferrand, 1919: p. 281. *Nu-ku* of Chau Ju-kua's *Chu-fan-chï* (trans. F. Hirth and W. W. Rockhill) 1911: p. 83. Cf. Schlegel, 1903: p. 239 (*But-nǫ-kǫ*); Rockhill, 1915: p. 259 (*Wên-lao-ku*, 1349); Jao Tsung-i, 1967: p. 196 (*Wên-lu-ku*, 1407); Ptak, 1992: p. 29.
48 Chau Ju-kua, 1911: p. 158 (and index).
49 Ferrand, 1919: pp. 281–282; Wada, 1929: p. 161; J. V. G. Mills (trans.) in Ma Huan, 1970: pp. 182, 207 [A.D. 1618] and map.
50 Chau Ju-kua, 1911: pp. 83, 210.
51 Rockhill, 1915: p. 256.
52 Jao Tsung-i, 1967: p. 196.s
53 Chau Ju-kua, 1911: p. 83.
54 Rockhill, 1915: pp. 66, 257.
55 Ibid: pp. 75, 259. Cf. Groeneveldt, 1880: p. 116 (*Kih-ri Tī-mun*, 1436, 1618).
56 Schafer, 1963: p. 155.
57 Kuwabara, 1935: p. 76; Needham, 1986: p. 277.
58 Thern, 1966: p. 41 [no. 256].
59 Li (trans.) 1979: pp. 5 ff.
60 Groot, 1892–1910: 2: pp. 296 ff.

61 Aurousseau, 1923: p. 233.
62 Devéria, 1850: p. 89.
63 Ma Tuan-lin [ca. 1300] (trans. Le Marquis d'Hervey de Saint-Denys) 1876: pp. 95, 261, 359–360, 365, 379, 404, 510; Pelliot, 1903: p. 274 (T'ang); Chavannes, 1916: pp. 213, 217 (Wu-Yüeh, 10th century). For camphor in tribute, see Donkin, 1999: pp. 214–217.
64 Wheatley, 1961: pp. 49–50.
65 Rinpoche, 1973: pp. 168, 174, 296. On the use of perfumes in Tibet, see Klaproth (trans.) 1830: pp. 168–169, 339.
66 Wolters, 1960: pp. 338–340, 1967: pp. 84, 95, 102–103, 107, 109. Eventually, *ju* was used to describe both products.
67 Wolters, 1967: p. 111.
68 Donkin, 1999: pp. 209–228.
69 Flückiger and Hanbury, 1879: p. 281; Giles, 1911: p. 24 [XX. 301]; Wheatley, 1959: p. 45; Schafer, 1963: p. 171, 1977: p. 111; Miller, 1969: p. 49. Loewe (1971: p. 175 n. 8) thought the report "probably dubious."
70 Chau Ju-kua, 1911: p. 209. See also Groeneveldt, 1880: p. 117 ("useful for dispelling bad breath"—*History of the Ming*).
71 Laufer, 1918: p. 30; Wolters, 1967: pp. 39, 137, 232–233, 270 n. 37, 292.
72 Chau Ju-kua, 1911: p. 176.
73 Wang Gungwu, 1958: p. 111 n. 97 ("south of Chiao-chou and Ai-chou," seventh century).
74 Schafer, 1963: p. 171.
75 Chau Ju-kua, 1911: pp. 61, 77, 81 [12] (Chou K'ü-feï [1178] on *Shö-p'o*), 209. Ma Tuan-lin [ca. 1300] (1876: p. 500) also refers to Java.
76 Chau Ju-kua, 1911: p. 84.
77 Maspero, 1928: p. 133 (Campā, 1018).
78 Ma Tuan-lin [ca. 1300] 1876: p. 500 (*Che-po* or *To-po*, 992, with camphor, possibly 'presents' to officials of the court).
79 Ferrand, 1922: p. 25; Wolters, 1971: p. 61 (Śrī Vijaya or Malāyu-Jambi, 1377).
80 Groeneveldt, 1880: p. 117. See also Ptak, 1992: pp. 29, 31–32, and map 1 (late Yüan and early Ming, with the sea routes followed); Reid, 1988–1993: 2: p. 4.
81 Chau Ju-kua, 1911: p. 89.
82 Chau Ju-kua, 1911: p. 133 (cloves, cardamom seeds, and camphor traded for horses, pearls, and dates). Idrīsī [ca. 1154] (ed. and trans. A. Jaubert, 1836–1840: 1: p. 51) refers to cardamoms, cloves, nutmegs, and mace reaching Aden from China, perhaps here standing for the Orient generally.
83 Rockhill, 1915: pp. 445, 447–448.

84 Ibid: p. 624.
85 Ishida and Wada, 1954: figure 51; *Shōsō-in*, Tokyo, 1978: no. 105 (reproduced here as Figure 22).
86 Kimura Kōichi, 1954: pp. 1–7; Ishida and Wada, 1954: p. 5 [English summary], *caryophilli*.
87 Tamba (ed. and trans. E. C. Hsia, I. Veith, R. H. Geertsma) 1986: 2: p. 31 (ten ingredients, including also musk, *she-hsiang*).
88 Schafer, 1963: p. 171; Needham, 1986: p. 277.
89 F. P. Smith, 1871: p. 67; Schafer, 1963: pp. 171–172.
90 Unschuld, 1986: p. 106.
91 F. P. Smith, 1871: p. 67 (largely repeated in Stuart, 1911: pp. 95–96); Hübotter, 1929: p. 296, 1957: p. 60; Read and Liu Ju-Ch'iang, on *Pen Ts'ao Kang Mu* [1596] 1927: p. 18 [225], 1931: p. 66 [244]; Hooper, 1929–1930: p. 61 [108], Chinese pharmacies in Malaya; Schafer, 1977: p. 111 (T'ang); Duke and Ayensu, 1985: 2: p. 457.
92 Hübotter, 1957: pp. 60, 146 [20]; Rinpoche, 1973: pp. 78–79 (pills and syrups), 81 ("concentrated medicine," *khan da*).
93 Hirth and Rockhill, in Chau Ju-kua, 1911: p. 211; Wolters, 1967: p. 137.
94 Hirth and Rockhill, in Chau Ju-kua, 1911: p. 210; Bretschneider (1882–1895) 1937: 3: p. 124; Schafer, 1963: p.185.
95 Bretschneider (1882–1895) 1937: p. 124; Roi, 1955: p. 143; Schafer, 1963; p.185, 1977: p. 111; Wolters, 1967: p. 137. Cf. Wheatley, 1959: p. 100; and *supra* p. 12.
96 Schafer, 1954: p. 66.
97 Rockhill, 1915: p. 257.
98 Hirth and Rockhill, in Chau Ju-kua, 1911: p. 81 n. 12.
99 Chau Ju-kua, 1911: p. 210 (*Huang-ma-chu* and *Niu-lun*).
100 Ma Huan (trans. J. V. G. Mills) 1970: p. 19.
101 Groeneveldt, 1860: p. 107.
102 For the dates, routes (as far west as the coast of East Africa) and organization of the seven or eight expeditions, see Su Chung-Jen, 1967: pp. 198–211.
103 Chau Ju-kua, 1911: p. 210.
104 Stuart, 1911: p. 276; Hübotter, 1929: p. 291, 1957: p. 76; Schafer, 1963: p. 185; Rinpoche, 1973: pp. 27, 69, 73, 75–76, 78–79; Duke and Ayensu, 1985: 2: p. 450.
105 Chau Ju-kua, 1911: p. 208.
106 Rockhill (ed. and trans.) 1915: p. 257.
107 Ibid: p. 259. See also Ptak, 1983: pp. 37–48, 1992: p. 31.
108 Ma Huan, 1970: p. 91.

109 Chau Ju-kua, 1911: p. 49. Richard Hakluyt ([1589] 1965: 1: pp. 218–219), in discussing "whence drugs come" distinguished between *sandals wilde* (from Cochin) and *sandales domesticke* (from Malacca, presumably drawing on Timor). Bretschneider ([1882–1895] 1937: 3: p. 459) observed that "the ancient Chinese authors state that [sandalwood] does not grow in China. Its fragrant wood is brought from the countries of the South Sea...."

110 Chau Ju-kua, 1911: p. 61.

111 Ibid: p. 84; Ma Tuan-lin [ca. 1300] 1876: 2: p. 496.

112 Chau Ju-kua, 1911: p. 69.

113 Ma Tuan-lin [ca. 1300] 1876: 2: p. 510; Wheatley, 1961: pp. 51–52 (*T'ung Tien*, a T'ang encyclopaedia from the end of the eighth century, and the *Hsin T'ang Shu* [1060]).

114 Hirth and Rockhill, in Chau Ju-kua, 1911: p. 209 (Fu-nan); Burkill, 1935: 2: pp. 1826–1833; Schafer, 1957: pp. 130–131.

115 White *chön-t'an* in "*Pa-lai* in southern India," in the *Wei-shu* [386–550], quoted by Hirth and Rockhill, in Chau Ju-kua, 1911: p. 209 [12, note]; Laufer, 1919: p. 318 (export to "Camboja [*Chen-la*] and the anterior Orient," according to the Annals of the T'ang); Schafer, 1963: pp. 136, 186, 221, 310 n. 34 (T'ang).

116 Chau Ju-kua, 1911: p. 111.

117 Ibid: pp. 88–89.

118 Ibid: p. 126.

119 Rockhill (ed. and trans.) 1915: p. 623. For Chinese involvement in the trade in sandalwood (red, ? and white) at *A-tan* (Aden, ca. 1433) and *La-sa* (? Somali coast, 1436), see ibid: pp. 609, 617.

120 Burkill, 1935: 2: p. 1828; Wilkinson, 1955: 1: p. 444. Huyghen van Linschoten (or Paludanus) [1596–1598] (ed. A. Coke Burnell and P. A. Tiele 1885: I: p. 21) refers to "great store of woodes of redde Sandale" in Madagascar. Cf. comment in W. Foster (ed.) 1906–1927: 1 [1618–1621]: p. 67 (an unsuccessful search for [? white] sandalwood in Madagascar).

121 Pelliot, 1903: p. 270 ("une image heureuse en santal de l'Inde").

122 Chavannes, 1916: p. 220.

123 Wolters, 1967: p. 168.

124 Schafer, 1963: p. 136 (? in Sumatra or Borneo).

125 Groeneveldt (trans.) 1880: p. 109. See also Ma Tuan-lin [ca. 1300] 1876: 2: p. 569.

126 Maspero, 1928: p. 128.

127 Ma Tuan-lin [ca. 1300] 1876: p. 500.

128 Groeneveldt (trans.) 1880: p. 137; Wheatley, 1961: p. 90.

129 Ferrand, 1922: p. 56; Wheatley, 1961: pp. 217, 297 (quoting Abū Zaid).

130 Chau Ju-kua, 1911: p. 208.
131 Hamilton [1727] (ed. W. Foster) 1930: 2: pp. 74–75.
132 Tun Li-ch'en [b. 1855] *Annual Customs and Festivals in Peking* (trans. D. Bodde) 1936 [1965]: p. 103. China received sappan wood in tribute from Japan (*Wa*) under the Ming (Tsunoda Ryûsaku [trans.] and L. C. Goodrich [ed.] 1951: p. 118).
133 Jirō Harada, 1950: p. 26 (pl. XXIV, upper). Schafer (1963: p. 310 n. 50) observed that "objects of sandalwood are very rare in the *Shōsōin* collection, in contrast to sanders [*Pterocarpus* spp.], which are abundantly represented." I find no reference to cloves, nutmegs, or sandalwood in *Nihongi*, the chronicle of ancient Japan (ed. and trans. W. G. Aston, 2 vols., 1896). The Dutch imported all three in the 17th and 18th centuries.
134 Schafer, 1963: pp. 267, 269.
135 Unschuld (trans.) 1986: p. 246.
136 Hübotter, 1957: p. 95; Rinpoche, 1973: pp. 27, 57, 69, 73–76, 80–81, 168; Bhagwan Dash, 1976: pp. 276, 324–325.
137 T. G. Pigeaud (trans. "The Kingdom ordered according to Holy Tradition") 1960: 5 vols.
138 J. Leyden (trans.) 1821; C. C. Brown (trans.) 1952 [to the arrival of Afonso Albuquerque in *Malaka*]. Malay text edited by R. O. Winstead, 1938.
139 Wolters, 1967: p. 58 and map 2, 1982: p. 35 n. 3.
140 Ibid: p. 63. Wheatley (1983: p. 128) refers to "the strong Indo-Scythian influence that permeated the culture of Fu-nan...in the middle of the fourth century."
141 Wolters, 1967: pp. 164, 211, 216, and map 3.
142 In placing *Tan-Tan* in the Malay peninsula (rather than Java), I follow Wheatley, 1961: pp. 51–55, and fig. 12. Cf. Wolters, 1967: p. 202, and map 3.
143 Wolters, 1961: p. 423, 1968: pp. 151, 165. *Ho-lo-tan* sent seven missions between 430 and 452 (van der Meulen, 1977: pp. 103–105).
144 Ferrand, 1922: pp. 1–104, 160–244; Wolters, 1961: pp. 417–424, 1967: pp. 229–253; Wales, 1978: pp. 5–12.
145 Wolters, 1967: p. 231. Śrī Vijayan missions to China commenced in 670–673.
146 Coedès, 1968: p. 158.
147 Simkin, 1968: pp. 116 ff.
148 Wolters, 1971: p. 42.
149 Wolters, 1979: p. 2.
150 Wolters, 1971: p. 61.
151 Wisseman, 1977: pp. 197 ff.

152 Tomé Pires [1512–1515] (ed. and trans. A. Cortesão) 1944: 1: pp. 45–46, 159, 2: p. 270 ("cloths of thirty kinds" to Malacca from Cambay, in return for cloves, nutmeg, mace, and sandalwood); Meilink-Roelofsz, 1962: p. 24.
153 On smuggling under the Ming, see Chan Cheung, 1967: pp. 223–227.
154 Noorduyn, 1978: pp. 207–274; Robson, 1981: pp. 259–292.
155 Pires, 1944: 1: p. 174; Reid, 1990: p. 15.
156 Ibid: p. 193.
157 Ibid: p. 206.
158 Barbosa [1518] (ed. and trans. M. Longworth Dames) 1918–1921: 1: p. 154 (Gujarātīs, from Cambay), 2: pp. 135 ff. (merchants of *Bengala*, Indians, Arabs, Persians); Subrahmanyam, 1990: pp. 95–98, and Arasaratnam, 1991: pp. 42–45 (Coromandel).
159 Pires, 1944: 1: p. 159. Gujarātī vessels generally reverted to the Sunda route after Malacca was captured by the Portuguese (1511).
160 Sá (ed.) 1956–1958: 1: pp. 29–30.
161 Pires, 1944: 1: p. 45. The accumulation of silt in the Gulf of Cambay put the port at an increasing disadvantage and it was overtaken by Sūrat in the early seventeenth century.
162 Manguin, 1985: p. 9.
163 Pires, 1944: 1: pp. 16 (Aden), 21 (Hormuz), 43 (Cambay), 86 (Sri Lanka), 93 (Bengal), 99 (Pegu), 108 (Siam), 111 (Burma), 114 (Campā), 123 (China). See also ibid: 2: pp. 265, 268, 283 (foreign traders in Malacca, and the four municipal *xabamdares* with jurisdiction over them).
164 Varthema (trans. J. Winter Jones, ed. N. M. Penzer) 1928: p. 84. See also González de Mendoza [1585] (trans. R. Parke [1588], ed. G. T. Staunton) 1853–1854: 2: pp. 318–319.
165 Shrieke, 1955–1957: 2: pp. 230–233. Cf. Galvão [1544] (ed. and trans. H. Th. M. Jacobs) 1971: p. 83 (conversion by "Persians and Arabs" some "80 or 90 years ago").
166 Polo (ed. and trans. H. Yule, rev. H. Cordier) 1903: pp. 272–274.
167 Pigeaud (trans.) 1960–1963: IV: p. 34.
168 Ibid: pp. 37, 98.
169 Ibid: p. 37.
170 Pires, 1944: 2: pp. 265, 268; Anon. *Descrição* [1529] in A. B. de Sá (ed.) 1954–1958: 4: p. 17 (Banda's "muitos jumquos"); Villiers, 1990a: p. 85.
171 De Brito (letter from Ternate to the King, February 11, 1523) in A. B. de Sá. (ed.) 1954–1958: 1: p. 155.
172 Barbosa, 1918–1921: 2: p. 205.
173 Pigafetta (ed. and trans. R. A. Skelton) 1969: 1: p. 141.
174 Meilink-Roelofsz, 1962: p. 163 (from Makassar to Malacca).

175 Valentijn, 1724–1726: 3: pp. 306–313, with illustrations.

176 Pires (ca. 1515) 1944: 1: pp. 118 n. 2, 209, 216 (Ceram), 219 (Bachian); Pigafetta (1521–1522) 1969: 1: p. 128; Huyghen van Linschoten (1596–1598) 1885: 2: p. 307; Barbosa (ca. 1518) 1921: p. 204 (Moluccas—"many red parrots...very tame...called *noires*," Malay *lūrī*, *nūrī*).

177 Schafer, 1963: p. 100 (*pañcavarnagini*, five-coloured parrots).

178 Ma Tuan-lin (ca. 1300) 1872: 2: p. 529 (from *Ho-ling*, west-central Java, 813); Krom [1926/1931] (Sarkar) 1957: p. 73 (Śrī Vijaya, 724). On the location of *Ho-ling*, see W. J. van der Meulen, 1977: pp. 87–110.

179 Al-Dimashkī [ca. 1325] (ed. and trans. A. F. Mehren) 1874: p. 205 (*Rāmnī* island); Waṣṣāf (ca. 1300) in Tibbetts (trans.) 1979: p. 60 (*Mūl-Chāva*, Java, "parrots crying out in Arabic....").

180 Swadling, 1996: pp. 16, 49, 54–57, 205, 273. Some of the crews of boats shown on Dong S'on bronze kettledrums (map 9) appear to be wearing plumed headdresses. Swadling claims that spices and aromatic woods were of only secondary importance during the "first trade cycle," but took precedence during the second (from ca. A.D. 250–300). The evidence is scanty and the chronology problematical.

181 Ma Huan (1433) 1970: p. 89 ("New Village" with "more than a thousand [Chinese] families. Foreigners from every place come here in great numbers to trade.") Also Groeneveldt, 1880: pp. 47–48; Rockhill, 1915: p. 241.

182 Pires, 1944: 1: pp. 45–46.

183 According to J. V. G. Mills (in Ma Huan, 1970: p. 182), "the Chinese ceased sailing to the Moluccas before 1430."

184 Barros [1563] 1777–1788: Dec III(i): pp. 576–580; Galvão [1544] 1971: p. 79; Garcia da Orta [1563] (ed. Conde de Ficalho, trans. C. Markham) 1913: p. 28; Leonardo de Argensola [1609] (ed. and trans. E. H. Blair and J. A. Robertson) 1904: p. 222 ("The Chinese occupied all these islands when they subjugated all that orient, then the Javanese and Malays, and lastly the Persians and Arabs"); Thomas Pennant, 1800: p. 154; Ferrand (trans.) 1913–1914: 1: p. 165.

185 "[People of South East Asia generally] use their currency, which is the *fang* (*fāo*); and also in this country [the Moluccas] there is no other coin but theirs [the Chinese], because they have no copper, nor are they accustomed to making them in any material" (Galvão [1544] 1971: p. 79). On copper cash, see Villiers, 1981: p. 735 and n. 54.

186 At about this time, a Javanese vessel, laden with cloves, was driven to Madagascar in a storm (Tiele, 1875: p. 231).

187 Alexander Hamilton [1727] (ed. W. Foster) 1930: 2: p. 74; Boxer, 1948: pp. 178, 266; Ormeling, 1957: p. 97. The Chinese maintained a customs house

in Macao, imposing import and export duties and anchorage fees (Chang, 1934: pp. 100–101).

188 Pigafetta, 1969: 1: pp. 117–118, 124.

189 Pires, 1944: 1: p. 208. See also Leur, 1955: pp. 209–210; Ellen, 1979: pp. 60–64.

190 Leur, 1955: p. 152; Meilink-Roelofsz, 1962: p. 157; Arun Das Gupta, 1987b: p. 243.

191 Fedrici, in Hakluyt (ed. and trans.) 1903–1905: V: p. 405.

192 Meilink-Roelofsz, 1962: p. 163; Villiers, 1981: p. 747.

193 Thomaz, 1979: pp. 107–108.

194 Silva [1988] 1996: pp. 265–266.

195 Andres de Urdaneta [1525–1536] (ed. and trans. C. H. Markham) 1911: p. 85. Around 1518, cloves in the Moluccas sold for 1 to 2 ducats the *bahar*, in Malacca for 10 to 15 ducats "according to the market" (Barbosa, 1921: p. 228).

196 Naersen and Jongh, 1977: p. 94; Silva [1988] 1996: pp. 263–264.

197 Leonardo de Argensola [1609] 1904: p. 223.

198 Chartered 1602; preceded by and incorporating the *Voorcompagnieën*, 1595.

199 Leirissa, 1979: pp. 315 ff.

200 Chaudhuri, 1965: p. 167. The first imports to England directly from the East, in four vessels that arrived in June 1600, consisted of 180,000 pounds of pepper, 14,000 pounds of cloves, 8,000 pounds of mace, and a small amount of nutmeg (Guerra, 1966: p. 53).

201 William Dampier [1683–1698] 1906: 1: p. 325; Alexander Hamilton [1727] 1930: 2: p. 74; Ricklefs, 1993: p. 63; Andaya, 1993a: pp. 201–206. Special sea patrols (*hongi tochten*) and landing parties were organized for this purpose.

202 Fryer (ed. W. Crooke) [1698] 1909–1915: 1: p. 132. Similarly, from the early seventeenth century, John Saris [ca. 1613] (ed. E. M. Satow) 1900: p. 203. On Dutch policy and the production and prices of spices (chiefly cloves and nutmeg), see Glamman, 1958: pp. 91–111; Reid, 1988–1993: 2: pp. 22–23.

203 F. C. Danvers and W. Foster (eds.) 1896–1902: II: p. 276. For illustrations of Dutch opposition, see ibid: pp. 127, 209 (1614), III: pp. 132, 260 (1615, Banda and Amboina), IV: pp. 48, 67 (1616); W. N. Sainsbury (ed.) *Calendar of State Papers: Colonial Series* I (1513–1616) 1862: pp. 232 [591], 365[862], 454[1082], 462[1104], 468[1127], 472[1147]; II (1617–1621) 1870: pp. 154 [335], 163[342], 167[357], 175[384], 319[932]; III (1622–1624) 1878: pp. 95 [236], 154[327], 198[368], 208[368], 210[370], E.

B. Sainsbury and W. Foster (eds.) 1907–1938; VI (1660–1663) pp. 58, 71, 230, 241, 265. The Anglo-Dutch contest over Pulo Run (Banda group) is the centerpiece of G. Milton's *Nathaniel's Nutmeg* (1999), especially pp. 271–308, 363–365.

204 Pedro de Heredia (1617–1620) has left an early list of Dutch *factorijen* and garrisons in the Orient, between Negapatam and Coromandel in India and Japan (E. H. Blair and J. A. Robertson, ed. and trans., 1903–1909: XVIII: pp. 107–111). The first English factory, at Bantam in western Java, was founded in 1602. This and most later factories were not accompanied by forts, unlike places controlled by the Portuguese, Spaniards, and Dutch.

205 Takekoshi, 1930: 1: p. 300; Chang, 1934: p. 62; Arun Das Gupta, 1987b: p. 253 (Portuguese).

206 Urdaneta [ca. 1535] 1911: p. 88.

207 Manrique [1629–1643] (ed. and trans. C. E. Luard and H. Hosten) 1927: I: p. 31 (the Portuguese); Prakash, 1985: pp. 54, 93, 157, 240, 1991: pp. 118–126 (the Dutch).

208 Danvers and Foster (eds.) 1896–1902: I [1610]: p. 76. See also ibid: V [1617]: pp. 63 (*Jasquis*, Jaki, a port on the Persian side of the Gulf of Oman), 234–235, 244, 289 (Iṣfahān).

209 Glamman, 1958: pp. 93, 103, 301–302; Boxer (1965) 1990: p. 223 (Sūrat); Prakash, 1987: pp. 185, 189, 193, 197 (Sūrat). According to Reid (1990: p. 11), the Dutch sold spices in Europe at 17 times and in India at 14 times the prices paid in the Moluccas.

210 Boxer, 1933: pp. 1–31, 1933–1934: pp. 27–77.

211 Kaempfer [1690–1692] (ed. and trans. J. G. Scheuchzer [1727])1906: 2: p. 214 [A.D. 1692]; Takekoshi, 1930: 2: p. 122 (sandalwood, 1621), 3: p. 205 (cloves, nutmeg, sandalwood, eighteenth century). Takekoshi (1: p. 500) claims that Japanese traders were in contact with *Marucco* (Moluccas) at this time, but no authority is given. See also Boxer, 1950; Prakash, 1985: p. 121 (sandalwood and spices).

212 Letter of William Adams from Japan (1613) in T. Rundall (ed.) 1850: p. 58 ("this countri doth not use verri much therof [*cloues*], nor any other spice").

213 Juan González de Mendoza [1585] 1853–1854: 2: pp. 318–319.

214 Manrique, 1927: 1: p. 381. The kingdom of Pegu, according to Duarte Barbosa [ca. 1518] (1866: p. 184), had "much trade in cloves and mace."

215 Chaudhuri, 1965: p. 168; Bassett, 1968: p. 93; Leirissa, 1979: pp. 318–319; Prakash, 1985: pp. 14, 94; Villiers, 1990b: p. 151; Prakash, 1991: pp. 112–117; Reid, 1988–1993: 2: p. 278.

216 John Saris, in Thomas Astley (comp.) 1745–1747: 1: p. 505.

217 Jourdain (ed. W. Foster) 1905: p. 294.
218 Tavernier [ca. 1650] (trans. V. Ball) 1889: 2: p. 16.
219 Floris [ca. 1611–1615] (ed. W. H. Moreland) 1934: p. 88.
220 Groeneveldt, 1880: p. 116; Ptak, 1983: p. 40 ("its smell is suffocating and one easily falls ill" [1617/1618]).
221 Wilkinson (1920) 1957: p. 72.
222 J. D. Gimlette, I. H. Burkill (eds.) and Munshi Inché Ismail (trans.) [1886] 1930: p. 432; Gimlette and Thomson, 1939: p. 40; Perry and Metzger, 1980: p. 372.
223 Rebello [1561–1569] in A. B. de Sá (ed.) 1954–1958: 3: p. 379. *Giroso* is not a Malay word.
224 Slooten, 1959: p. 322.
225 Ibid: p. 321.
226 I-Tsing, 1896: p. 48. The flavoring of tobacco with cloves, especially in Indonesia (Chopra, 1933: pp. 86–87; Tidbury, 1949: p. 197; Simmonds, 1979: p. 216; Reid, 1985: pp. 535–536) probably can be traced to their earlier use with betel.
227 Galvão, 1971: p. 43. See also Tidbury, 1949: p. 199.
228 Donkin, 1999: pp. 186, 192–197.
229 Reid, 1985: pp. 529–530; Donkin, 1999: pp. 186–192.
230 Gimlette and Burkill, 1930: p. 429; Gimlette and Thomson, 1939: pp. 26–27; Perry and Metzger, 1980: p. 279.
231 Burkill and Haniff, 1929–1930: p. 242.

EPILOGUE

From the time of Herodotus, Europeans have striven to describe and to comprehend the inhabited or inhabitable world, *oikoümenē*. Exploration was prompted by an explosive mixture of curiosity and greed. What we now call the Age of Discoveries had its roots in the Renaissance of the Twelfth Century and came to fruition in the late fifteenth and early sixteenth centuries. The period was first dominated by men of the Italian city states and of Cataluña, joined, in the second half of the fifteenth century, by the Portuguese. The Spaniards, following the *Reconquista*, had exploration thrust upon them. Piloted by Italians, they established a foothold in the New World (1492); urged on and led by Portuguese defectors, they sponsored the first circumnavigation (1519–1521). Between these two dates, or rather over a mere two decades (1497–1517), the Portuguese rounded the Cape of Good Hope and founded trading posts across almost the width of the Old World, from Sofāla in East Africa (1505) and Baḥrein (1507) and Hormuz (1507/1514) on the Persian Gulf, to Goa (1510), Malacca (1511), and Colombo (1517). The Strait of Malacca was then "the crucial sector of the world's major trade route,"[1] extending from Lisbon to the Moluccas. Only Aden of the great maritime entrepôts of Asia escaped their grasp.

Before the silver of Mexico and Peru began to reach Seville in quantity in the middle of the sixteenth century, Portuguese achievements in the East as a whole impressed Europeans far more than what the Spaniards claimed to have found in the West. It took time, a century or more, to comprehend the significance, if hardly the full significance, of the discovery of what became known as the New World. The East, on the other hand, was to some extent already part of the European experience and, to a much larger extent, part of European folklore. The latter was not wholly displaced until the late ninteenth century, if indeed a small fraction does not survive to the present day.

Unless the Portuguese took special note of the controversial *Itinerario* (1508) of the Italian adventurer Ludovico Varthema, it is unlikely that they had a clear idea of the location of the Spice Islands before they took Malacca in 1511. The revealed position of the islands, at the eastern extremity of the Indonesian archipelago, put them, for Europeans, at the ends of the earth, which aptly

enough accorded with tradition and, in Rumphius's view, with divine Providence. Consequently, it was also appropriate that the Papal division of the world by the Treaty of Tordesillas (1494) should place the Moluccas in a kind of geographical limbo, between East and West, on the then indeterminable limits of Portuguese and Spanish jurisdiction. In any event, their discovery by Europeans marked the close of the first, medieval half of the Age of Discoveries. With much still to discover, the second half lasted from the early sixteenth to the late nineteenth centuries.

The principal object of Magellan's great enterprise on behalf of Spain was to reach the Spice Islands by sailing west, a voyage with, at the time, no known means of return other than circumnavigation. Until the Manila-Acapulco route was pioneered in the 1560s, the products of East and South East Asia that were bound for Europe flowed exclusively from east to west. The westward return was reinforced by the arrival of the Dutch and the English, both with possessions in India, in the late sixteenth and early seventeenth centuries.

The trade in spices and *aromata* generally usually is seen in exclusively European terms. Purchasing power, acting like a magnet, drew supplies to the Mediterranean region from at least Greco-Roman times. The exorbitant prices of the rarest products increased their appeal in the higher levels of the social hierarchy. Indeed, access to such *exotica* helped to define the hierarchy. It is doubtful, however, whether European demand could or would have been met, or would even have existed, prior to ca. 1500 if the same products also had not been in high demand over much of Asia—in the Arabo-Persian world, trading with the Far East from at least the seventh or eighth century, and, above all, in India, with contacts forged up to a millennium or so earlier. It is the latter, what has here been called the Indian bridge, that brought many eastern products to within reach of Europe by the opening decades of the Christian era. The Arabs extended the bridge westward to the ports of the Levant.

For many centuries, Javanese merchants shipped Moluccan products to the more accessible ports of central and western Indonesia. Early Indian settlement stopped short of the Moluccas. The chief objective of the Persians and Arabs was China. Apart from the Malays, Javanese, and other islanders, only the Chinese (in the fourteenth and fifteenth centuries) and the Europeans (from the sixteenth century) tapped supplies of cloves, nutmegs and sandalwood at source. That Yüeh boatmen traded directly with the Moluccas at some early date is doubtful. Whether Malays or Indonesians at any time took spices directly to India and introduced or re-introduced sandalwood are questions that it may always be impossible to answer with certainty.[2] Tomé Pires (1512–1515) preserved reports of Javanese trade with Bengal, *Benua Quilim* (Coromandel), and Aden.[3] Also questionable, but probably more capable of

resolution, are claims that Moluccan species had been introduced to Annam and south-coastal China by about the eleventh century. This is part of the larger question of the extent to which the Chinese transplanted and cultivated exotic plants for commercial or esthetic purposes in suitable parts of the homeland. Further light on the search for, and early trade in, East Indian spices is likely to come from the Chinese records. Arab accounts of South East Asia have been carefully examined and little that is new can be expected. Ancient and medieval Indian literature, as already observed, is weak on matters of time and place.

Spices shipped to the West were chiefly used as condiments; secondarily, but not always independently, as materia medica. Incense became important in Christian services; aromatic substances generally provided a means of neutralizing foul odors and supposedly of combating epidemic disease. Resinous vapors and perfumed pomanders, containing clove, nutmeg, and camphor, among other substances, were so employed throughout Europe into the eighteenth century.

In both India and China, the repertoire of materia medica ran to many hundreds of items, usually prescribed in elaborate combinations. New substances were easily added or substituted. Culinary and medicinal spices were even less clearly distinguished than in the medieval West; *aromata* were more important—an essential part of most public ceremonies, of domestic rituals, and the toilet of the well-to-do. Vast quantities were used in acts of worship. Hindu temples and Buddhist monasteries were the largest consumers.

Aromatic species naturally advertise themselves—as blossom, exudations, and in the smoke of woodland fires. Man's awareness and interest are indeterminably old. Over time, items that had to be prepared—dried or grated, pounded or mixed, often burnt—were added. Rather similar products might at first be conflated or confused and only later distinguished and separately named. The number in circulation, the variety of use and refinement of nomenclature are measures of our length of interest. Clove and nutmeg, native to small and, to all the great consumers, very remote islands were almost certainly relatively late additions to the total, possibly first collected in error or as substitutes for cinnamon and cardamoms, respectively. Bāṇabhaṭṭa in the seventh century described sandal ointment as "pleasant with the rich musk scent,"[4] the latter apparently paving the way for the former. Similarly, nutmeg in the medieval West meant musk-scented nut, *nux moschata*. The nature, age, and powerful motivation behind trans-oceanic trade are demonstrated by the presence of the luxury products of the East Indies, and most notably of the Moluccas, in the market-places of first ancient India and then of Han China, the Levant, and early medieval Europe.

Notes

1 Wheatley, 1961: p. 312.

2 Wheatley (1983: pp. 287–288) found only two references in the literature of ancient India to the presence of South East Asian merchants in India. On the use of Malay vessels between eastern Asia and India in the seventh and eighth centuries, see p. 144 *supra*. Manguin (1996: p. 182) maintained that "incipent states" in South East Asia (south Thailand, the western Malay Peninsula, and northern Java and Bali) "had established trading links with both India and Vietnam as early as the last few centuries B.C.," that is "long before Indian influences were felt in their region...around the 3rd century AD at the earliest."

3 Pires (ed. and trans. A. Cortesão) 1944: 1: p. 174. See also Barbosa [ca. 1515] (ed. and trans. M. Longworth Dames) 1: 1918: p. 56 (Aden), 2: 1921: p. 117 (Sri Lanka); Castanheda [1551–1561], 1924–1933: 1: p. 296 (Red Sea).

4 Bāṇabhaṭṭa (trans. C. M. Ridding) *Kādambarī*, 1896: p. 164.

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Indices

PERSONS

PLACES AND REGIONS

(Names found only in legends to maps are not included)

BIOLOGICAL CATEGORIES: ORDERS TO SPECIES

ETHNICS

(*Ethnic groups, religions, languages, dynasties, ideologies, styles*)

TITLES OF WORKS QUOTED IN THE TEXT

GENERAL

Between EAST and WEST

The Moluccas and the Traffic in Spices Up to the Arrival of Europeans

Up to and including the Age of Discoveries, the wealth of the East was thought in Europe to consist primarily and inexhaustibly of spices and aromatics. Clove, nutmeg, mace, and sandalwood all came from a few small islands in easternmost Indonesia, which no European reached before 1500, ad indeed no Arab or Indian merchant either, as far as we are aware. Yet supplies of these luxury products were reaching China, India, western Asia, and the Mediterranean lands more than a thousand years earlier.

Indian influences—cultural and commercial—began to permeate South East Asia from about the beginning of the Christian era. This "bridge" across the Bay of Bengal was extended westward by the presence of Indians in the marts and medical centers of the Near East and, from the late seventh century, by Arabs in the course of the expansion of Islam.

The present study of Moluccan spices opens with their natural history and nomenclature, and the discovery of the islands by Europeans near the opposing (and controversial) limits of Spanish and Portuguese jurisdiction. The monograph traces the expanding interest and long-distance trade in cloves, nutmeg, and sandalwood, first to India and thence to the adjacent Arabo-Persian world. The medieval West and China lay on the margins of diffusion, the former in touch with the Levant, the latter with the trading world of South East Asia.

Twelve maps and twenty-four illustrations accompany the text.

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